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MODELLING AND SCULPTURE

ALBERT TOFT

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ONE OF THE FIGURES OF THE WELSH NATIONAL WAR MEMORIAL

By the Author.

MODELLING AND SCULPTURE

A FULL ACCOUNT OF

THE VARIOUS METHODS AND PROCESSES

EMPLOYED IN THESE ARTS

BY

ALBERT TOFT

HON. A.R.C.A., M.S.B.S.

With 118 Illustrations & Diagrams

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PREFACE

INNUMERABLE books on almost every conceivable phase of Art have been published in recent years, and it may be asked why I, a sculptor by profession, have chosen to tread the thorny path of literature and add to their number.

I know of no work dealing exclusively, like this, with the purely technical side of plastic or glyptic Art, and affording the student, so far as a book can, every practical detail necessary to a complete knowledge of his craft.

I have endeavoured, as plainly and directly as possible, to place before him the result of many years' practical experience, and to show him how the knowledge acquired, stage by stage, of the modeller's and sculptor's art can be utilised; for I believe that this experience will be helpful to all those students who have an honest and whole-hearted desire to succeed in their profession, which has so many famous names on its roll of honour.

A book cannot make a man an artist—that is a matter depending solely on the possession of real artistic gifts—but many difficulties may be surmounted and unnecessary errors avoided if the student be shown at the beginning of his career the right way to go about his work.

No artistry worth the name can ever be fully attained without hard work, and without passing

through much humiliation, before even the lowest peaks of the heights are reached. All who follow the glyptic art must understand at the outset that they will pursue no primrose path. Mere trifling with it will avail them nothing; and unless the heart is in the work, it would be far better to abandon all pursuit of a profession that is so beset with difficulties and so disappointing in its results. But to those who really mean to succeed, resolved at all cost to surmount every obstacle, I say, Be of good cheer; Art has no limitations, and the vagueness of a dream may, with absolute faith in it and in oneself, become immortal accomplishment.

As in all effort towards achievement, it is the little things that count. The apparently insignificant minutiæ make the complete and perfect whole; and, as will be pointed out in these pages, it is the insistence on the truth of every detail that produces the greatest and best effects.

Inspiration is indisputably the supremest gift any artist can possess, but without hard work it must necessarily remain useless, because until it finds expression there is no realisable result of his imaginative power. Thought is indispensable to creation, but labour alone gives thought expression; and in the art of the sculptor, labour—much actual physical labour—is demanded from its votaries.

No matter how great the natural artistic gift, it is, at best, undisciplined and crude in its expression without the most rigid training and strict obedience to well-defined rules; and although at times—but very rarely—the world is startled by some *tour de force* of absolutely untrained genius, in Art, as in everything else, such a work of genius would have undoubtedly been even greater had the artist had

a thorough grounding in technical skill and a complete knowledge of those details necessary to a perfected art.

In these go-ahead days of hurry and hustle, when advertisers guarantee to make any person educated in well-nigh any subject under the sun in twelve lessons, it is well to remember Longfellow's words:—

> "In the elder days of Art,
> Builders wrought with greatest care
> Each minute and unseen part;
> For the Gods see everywhere."

Who can enter some cathedral or historic abbey, hallowed by the memories of a glorious past and sacred with the dust of centuries, without noticing this minute care exemplified in the least prominent parts of those magnificent edifices?

Men then worked for love of it, master sculptors, whose names have perished, although their exquisite work remains imperishable. They put their very best—all of which they were capable, their very souls—into the labour of their hands, making the stones immortal poems of praise and beauty. Yet, I doubt not, these sculptors of a distant past received a thorough and comprehensive training.

I cannot too strongly urge on the student "thoroughness." Disappointments he will have many, many failures, and much hard work before any attainment is possible; but having mastered the necessary drudgeries which attend all proper training, let him aim high, never despairing, nor doubting that his work will in time receive its due recognition and reward.

I speak out of experience when I say there is in all creative art a pleasure, almost a rapture, which

is in itself one of the most exquisite delights given to man; the sense of having accomplished worthy work, however far short it may fall of one's ideal, is "no matter for scorning—A moment's success pays the failure of years."

Even to such as do not pursue the sculptor's art as a profession, I am hopeful my book will be of service; for, whether as a means of living or a mere enjoyment for leisure hours, "Art colours Life as the Sun colours flowers," and no one, whether amateur or professional, can be the worse for the knowledge of the Beauty and Power of Art.

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GLOSSARY

Airjets.—Tubes arranged in a bronze founder's mould through which the air can pass when the molten metal is poured in.

Armature.—A structure made of wood, iron, compo-piping, or wire, upon which to build up a work in clay, plaster, or wax.

Banker.—A strong pedestal upon which to place a heavy block of marble or other piece of work.

Beating.—The act of stirring up plaster in a manner somewhat similar to that of beating up an egg. Beating up clay is also spoken of when making it from a hard or dry state into a workable condition, which is done after it has been saturated with water in a water-tight bin, by placing the clay upon a bench or table and beating it with an iron rod or stick.

Bronzing.—A word generally used to describe the process of colouring a plaster cast to imitate bronze.

Bust peg.—An upright post of wood fixed upon a flat board to form the main support upon which a bust is modelled.

Butterfly.—Two pieces of wood joined together by wire in the shape of a Latin cross, used for the purpose of attaching to the armature to carry a weight of clay.

Case, The.—An outer shell to hold the parts of a mould.

Chassis.—A framework used in the process of making an enlarged or reduced copy of a plaster model.

Chipping out.—The act of taking away with chisel and hammer the waste mould from the plaster cast.

Cire-perdue (lost wax).—A process of casting into metal from a wax model or cast.

Clay bat.—A flat slab of clay upon which to build, or from which to cut out (carve away) a work in relief.

Clay washing.—Paint ng over the outside of a mould with clay water before putting on the outer mould or case.

Clay water.—Water with a little clay mixed into it to somewhat the consistency of milk, and used in some instances instead of soft soap to prevent the joint of one mould piece from adhering to another.

Core, The, is that portion of the mould which forms the solid inside of a cast in metal, and which decides the thickness of the metal, by the space between it and the hollow mould surrounding it.

Cottle.—A band of clay to put round a work when moulding it to form a wall which will prevent the plaster going beyond a particular point.

Darks.—Those parts in a work which are in shadow as contrasted by the parts which are intended to catch high lights, or half tones.

Death mask.—A plaster mould taken from the face of a person after death.

Distance down.—Measurements taken down from the chassis on the hanging T scale, stick, or rule.

Distance in.—Measurements taken horizontally by the pointing stick in to a point on the clay or plaster model from the plumb lines over the chassis.

Ducts.—The channels through which the molten metal runs into the mould.

False cores.—The pieces made (of sand) by the bronze founder to form the mould on the outside surface of the model.

Feather edge.—A piece of wood tapered off at one edge to the thinness of a feather.

Filling-in.—Making the cast in a mould; the moment or time of pouring or putting into a mould the plaster.

Firing.—The process of converting a clay model into terra-cotta by baking it, so to speak, in a kiln.

Free pieces.—Pieces jutting out freely from a body or mass, as a piece of drapery blown from a figure and almost disconnected at its junction.

Gallows.—See illustration.

"*Gits*" *or* "*Gets.*"—The Gates. The opening or point of junction where the metal runners join the work.

Going-off.—When plaster is just beginning to set, or get firm, or become less liquid.

Hollowing out.—Scooping out clay from the inside of a model, as is done in the case of a work which it is intended shall be fired or baked so as to convert it into terra-cotta.

Joint lines.—Ridges in the cast formed by a division where two parts of a mould have come together.

Keyholes.—Notches cut or holes drilled into one side of a mould before making the mould piece which is to come next to it.

Keys.—The pieces formed by the plaster running into the keyholes on the plaster piece previously made.

Killed plaster.—A term applied to plaster when a certain amount of the strength of the lime contained in it has been destroyed by its remaining for a short period under water before mixing.

Lanterns.—Tubes of iron placed in the sand cores to allow the gas and air to pass through when the molten metal is poured into the founder's mould to form a cast.

Life.—Plaster is said to have lost its life when, through its having been kept in a damp place, it will not set hard when mixed with water. Again, the "life" is partially taken from plaster when it has remained

too long in the water before being beaten up, when we speak of it as "killed" (*see* Killed plaster), as is necessary when stopping holes in a plaster cast.

Modelling stand.—A table with a revolving top upon which to work, made of various proportions according to the size of the intended work The one used for busts and works of not larger scale are usually about 3 ft. 6 in. high, with an 18 in. square revolving top. It is advisable to have the one used for this purpose made to stand on three legs only.

Mould box.—The box used by bronze founders to hold the mould pieces together, and in their respective places.

Parting dust.—A dust or powder used by founders to prevent one portion of a mould adhering to the next piece made up against it.

Pâte-sur-pâte.—A method of modelling in very low relief by painting one layer, or coat, after another on to a background with a brush. The clay is made to the consistency of a thin paste, and in this way the desired relief is built up.

Patina.—A colour formed on metals by the atmosphere, or other natural causes, or by various acids.

Piece mould.—A mould made of a number of pieces over a work, so that the original shall be preserved undamaged; from such a mould a number of copies can be taken, whereas from the waste mould but one cast can be taken, the mould being destroyed in the process—thus the term "waste."

Pins.—Metal rods used to secure the bronze founder's mould box or frame.

Pitcher.—A heavy blunt steel tool used by the Pointer to remove some of the rough pieces from the block of marble before he commences to take any definite points.

Pointing stick.—A piece of wood in the shape of a foot-rule with a pointed end, upon which the scale measurements are set out. It is used for taking horizontally measurements when enlarging a model by the chassis process.

Preparing.—The second stage of progress in carving a work in marble after the pointing stage is finished; it is then prepared, or carved down closer to the surface.

Projection.—Distance out from a surface, as in the case of a relief; the distance out from the background.

Pulling.—When a clay model or portion of it will not easily leave the mould by reason of some undercutting in the mould.

Runner, A.—A stick of wax placed inside a founder's mould to form a channel through which the molten metal passes.

Running a moulding.—A term used in making mouldings by running a template over liquid plaster.

Running up.—Plaster or metal finding its way through and into all the parts of a mould.

Sand holes.—Small holes sometimes found in marble.

GLOSSARY

Scum.—The waste matter (in the form of froth, bubbles, and dirt) which appears on the top of plaster whilst mixing.

Setting.—Plaster is spoken of as setting when it begins to stiffen or get firm after having been mixed with water.

Setting back.—Cutting clay away from a part which has been built too far forward, or made of too great a projection.

Setting out a line.—Drawing a line on clay or other material, which is to serve as a guide from which other lines or points can be made or taken.

Shellac.—A solution of shellac and methylated spirit. Commonly called french polish, but known in the studio as shellac.

Slip.—Dry clay crushed to a powder, then mixed with water to the consistency of a thick cream.

Soaping.—Applying a solution of soap and oil to a mould to prevent a further coating of plaster adhering to it.

Squeeze, A.—An impression of a work taken with clay or wax from a mould by the action of squeezing or pressing the material into it, or, in case of a relief, on to it.

Stearine.—A kind of wax.

Stearining.—The act of applying a mixture of wax and turpentine to a work.

Strickle.—A template or straight-edge for levelling down to a desired depth.

Taking a point.—The process of taking the distance in measurement on a model by the needle on the pointing machine; or with the pointing stick, when enlarging a work.

Terebene.—A mixture of oil of turpentine with sulphuric acid, used as a medium for painting a plaster cast before bronzing.

Tight, or Close.—When clay is tough and of a very close nature, and will not cut freely, it is spoken of as tight or close.

Undercutting.—A term used to describe the carving of a projection just behind and beyond where it is visible to the spectator, in order to give "snap" and sharpness of effect.

Waste moulding.—A process of converting the wax or clay model into plaster. By this method one cast only can be obtained, as in the process the mould is broken up (chipped away) and thus is wasted.

Waxing.—The act of applying a solution of wax and turpentine over work in plaster, or other material which will absorb it.

PART I

MODELLING AND SCULPTURE

CHAPTER I

A SHORT DESCRIPTION OF THE PROGRESS MADE IN ENGLAND DURING THE LAST THIRTY YEARS

It is a notable and inspiring fact that the past quarter of a century has witnessed the renaissance of the sculptor's art in Great Britain. Previous to this, with a few exceptions, sculptors lacked distinction, inspiration, and artistic taste.

Nothing so mediocre as certain phases of art during the early and mid Victorian period could possibly find acceptance to-day; and the marked advance, alike in treatment and every other quality, is cause for rejoicing among all art lovers—more especially among those who are earnestly striving to raise British sculpture to a dignity which shall entitle its productions to rank with the noble achievements of classic and Renaissance times.

Giants among the pigmies, a Flaxman and a Stevens arose, almost isolated cases of genius, and it is a marvel that these artists were able to give us such splendid work, considering the extremely low level of their contemporaries in the British School of Sculpture.

The apotheosis of the Deadly Commonplace, the

environment of Unloveliness and the admiration of the Ugly Utilitarian made any genuine artistic effort during this period all the more remarkable.

But since then men of high intelligence, originality, and rare technical skill have arisen, whose sculptural work will compare with many of the lofty achievements of Greece and Italy; men whose individuality and creative genius render their work "a thing of beauty and a joy for ever." And yet it was but an accident of Fate that poor Stevens, perhaps the greatest sculptor since Michael Angelo, ever became known in his supreme greatness. How much poorer would the world of art have been by the exclusion of such a transcendent genius?

Happily, to-day, things have considerably changed for the better.

It is not only genius that arrests attention; numbers count also, and the number of men producing good sculpture in Great Britain at the present day is surprising. This is all the more significant when we remember that they are, one and all, remarkable for their individuality, whereas in some foreign schools, especially in the French, the system of education tends to produce a sameness in technique, a general likeness in selection of subject and arrangement, that suggest too great an influence of one or other professor or master, until individuality is lost, and the student becomes a copyist, even of the most marked faults of his master.

Fortunately, this is not the weakness of the British sculptor, whose dominating ideal is Truth, originally expressed through the mind as well as through the eye.

The French sculptor is distinctly more facile in execution, but the Briton stands pre-eminent in con-

ception and those qualities which go to make his labour of lasting value.

There can be no question, however, that France has produced, during the last half-century, sculptors whose work shows exceptional originality and genius; whose statues are not only of national but of world-wide fame; and although we may differ—and that seriously—as to the form, treatment, and selection of subjects, we are compelled to the greatest admiration of the inspiration and exquisite technical skill which have produced work beyond and above all carping criticism.

All mannerism in art is objectionable. The British student of sculpture is usually endowed with an individuality of his own, a something that develops after he leaves the modelling class, and soon becomes a recognisable quality of all the work he produces, a peculiarity to himself. He is no mere copyist. And it is this very quality about the British school of sculptors that makes it so strong and virile. For proofs of its excellence and of the progress made during the last thirty years in the art, one needs only refer back to the magnificent collection of exhibits at the Franco-British Exhibition in 1908, or to look round any one of our big provincial cities to-day, and compare the many fine recent memorials there erected with those of an earlier date, often in juxtaposition, as if to make the comparison more striking with those Early Victorian "horrors"!

London, at once the greatest city and the wealthiest in the world, magnificent in many of its architectural structures, with schools of art second to none in Europe, has failed signally to beautify her squares and public places with the sculptor's art. She has a notable few—very few—good statues, and a host of

villainously bad ones, which create ridicule rather than respect in the mind of the passer-by; but the time will surely come, and this perhaps at no distant date, when our great city will awaken to the fact that great sculptural monuments are not only wanted to beautify her streets, but have distinct educational value. They elevate the intelligence of the people, by keeping green the memory of our noblest heroes who have built up for us the history of this mighty empire.

There is no doubt that French art and the method of French training have influenced British sculptors, inasmuch as they demonstrated to us emphatically that there is only one course open if we desire to attain the Ideal, and that is — to study, with infinite care, closely and conscientiously, the *Real*, the *Natural;* to study Nature in her every possible mood or phase, to learn her ways, and having so absorbed her teaching, to make use, so far as in us lies, of whatever study comes nearest to our hearts, and to select the best from the good.

The more we study Nature, the more intense grows our love and reverence for her, and we become in the real sense students—able to penetrate and reproduce her mysteries.

Selection is one of the most important factors in an artist's career, for how is it possible to distinguish the best from the merely good unless we have studied both?

> "Try to be Shakespeare, leave the rest to Fate!
> The *aim*, if reached or not, makes great the life,"

may be applied, beyond the poet's intention, to all art students.

Michael Angelos will never, at any period of the

world's history, become common; but we can all, at least, strive for our supreme ideal.

To become an idealist you must necessarily first be a realist. So taught the Greeks, the Italians, and our friends on the other side of the Channel. And their axiom is true. Realism broadens, deepens, and expands our vision. It makes us more capable of appreciating the great Greek works, and of understanding how, by the closest study of Nature, they were wrought. This is a fact which no student of the classic sculpture of ancient Greece could deny. They went direct to Nature—the only Eternal—and in mere human models saw, as with an inspired insight, the God-like forms we recognise to-day as the master-work of men themselves divine, whose statues have, through the passing of the ages, remained examples for subsequent artists, even to our own century.

True art it is impossible to produce without that actual technical knowledge which is only to be acquired by patient and painstaking study. What musician could compose any work worth listening to, unless he had mastered the intricacies of harmonies and counterpoint? What writer could hope to take rank in literature without the most perfect command of grammatical expression and of the proper formation of sentences; and what sculptor can possibly hope for success to crown his labours, unless he has thoroughly mastered the technique of that most difficult of arts?

A Spanish writer has said that "Sculpture is crystallised Poetry; the Music of the Spheres made visible, the Ideal manifest unchanging and unchangeable through the Ages!" and, allowing for the rhapsodical temperament of a southern author, it

is not altogether an untrue description of all that sculpture should be.

The great masters only wrought their masterpieces after such a study of Nature as we have indicated, although that alone could never make a great sculptor or painter. It is merely a proper training for all following or practising art, alike for the genius and the others.

The fact is, that with such a training we are able earlier in our career to realise the grandeur of the classic and antique sculptures in our museums; and these have increased in such numbers during recent years, either in their originals or plaster replicas, that the present generation of sculptors have had a great advantage over their earlier brethren. But these great Greek works have not alone inspired us to enthusiasm.

No, we have also to be thankful to the directors of the various museums for having placed within our reach, for our constant study, so many wonderful examples of the finest Italian sculpture of the fourteenth, fifteenth, and sixteenth centuries. There can be no doubt that these glorious works have exercised an immense influence on the workers in England at the present day. Indeed, I am inclined to think that we really owe the greatest debt of gratitude for the high excellence of our sculpture at this hour to the influence and inspiration of the best examples of the Italian Renaissance, which appeals more readily to us, alike in its treatment, temperament, and subjects, than the Greek.

This especially applies to Renaissance portraiture, which not only arouses our enthusiasm and ambition, but has moved us to emulation, with the most gratifying result to art.

Yet it is a strange and significant fact, that Italy to-day produces little or nothing notable in sculpture. Her day of mighty works in this art seems for ever past, and while her greatest musical composers have achieved a world-wide renown, no really great sculptor lives to carry on the traditions of her gloriously artistic past.

Facilities, almost unknown half a century ago, are given to students to study at first hand the noble examples of Italy's former supremacy in the sculptor's art. Of such facilities the British school has not been slow to avail itself. It is with the most hopeful feeling that we look around at the many workers in art to-day; and seeing so much that is excellent in their work, we have no fear that any decadence will set in, but rather rejoice in the prospect that it will continue to hold the high position it now occupies in the world's achievement.

CHAPTER II

THE IMPORTANCE OF GOOD TRAINING, AND THE FACILITIES AFFORDED THE STUDENT IN VARIOUS ART SCHOOLS

THE importance of good training from the very first attempts at modelling cannot be regarded too seriously, for it is in the earliest days that the student requires the greatest attention and direction in the *right* way. Whether it be his intention to take up the art as an amateur, or for the purpose of making it his profession, or for teaching it to others, it is equally important that in each case he should be trained with the utmost care and correctness for some years.

I have known pupils come to me asking how long it would take them to learn to model, and on the first occasion I was somewhat at a loss to answer this question.

My would-be pupil, seeing that I was puzzled, endeavoured to assist me out of the difficulty by remarking that she only wished to learn enough to be able to teach!

Imagine my feelings at the moment! for, I may say, I have found, after many years of practice in the art of modelling and sculpture, and moreover in giving instruction, that the difficulty of teaching is no light matter. Indeed, it is a great task, when done thoroughly and conscientiously, and of

the most fatiguing nature, requiring tact, patience, and no little skill. In fact, good teaching is an art in itself.

It is not unusual to find men who, though splendid teachers, are almost utterly incapable of producing anything fine themselves.

For this reason it is better for the student to place himself in the care of a man who has the reputation of being a good instructor, rather than in the care of one whose work may have arrested his attention at an exhibition, or on the gallery wall, unless such an one be known to be capable both as a teacher and producer.

Good training is most essential, no matter how much or little natural ability the pupil may possess.

It is not surprising that many of our art schools, the London County Council and others, attract so many students to their institutions, when we know that the staff of professors and masters are carefully chosen for their reputation as teachers, and not alone for the works they have produced.

Besides the excellent teaching, the facilities afforded to students in these schools leave nothing to be desired. Indeed, I often think that there is too much consideration lavished upon them, and I am not so sure that more difficulties to contend with would not in some instances prove beneficial and produce better men; although it must be granted that the lack of such facilities might handicap the bulk of students, and especially those who make the best use of the opportunities afforded.

But I question whether most of the students fully appreciate, or appreciate to any extent, what is thus done to render it easier for them to make progress in their calling. These schools are equipped with

every requirement, and are open to all, with an entrance fee which is practically nil.

Such splendid opportunities must bear fruit in time to come, and it will be the fault of the student if he has not availed himself to the fullest extent of such chances as are offered him, and if he fails to give proof of this in after life.

How different things were thirty years ago! A boy had then to knead his own clay, and perhaps wheel his own model to the mould-maker's workshop, unless he could mould it himself; and, even then, there was no convenience for moulding and casting being done in the art schools of that day; and certainly no instruction was given in the process of converting a clay model into plaster. As for the material used for this purpose, well, that was in no instance provided, as it is to-day, but had to be paid for out of the student's own pocket.

Few of our leading sculptors of to-day had anything but hardships to fight through, and immense difficulties to surmount in their student days. Yet, look at the successes they have achieved.

What would they have done, given the same opportunities as are afforded the student at the present time? Perhaps less??

But given all these chances, they will not make a boy an artist; they may help him to become a better workman, but that is all. There must exist a natural love for the work, combined with the determination to achieve something great. These are factors which alone make the art student worthy of his chosen calling.

I do not say he should not reach the goal all the same, if he has the love and determination, and all the quicker when he receives the assistance he is

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able now to get at these institutions; but it makes the end no less far off and little less difficult of achievement, for, before you arrive at the production of great art, you will find the path beset with obstacles which cannot be overcome except by your own individual struggling, no matter how much outside help may be given by Boards of Education or other governing bodies. And the young student whose desire it is to produce work worthy to take place in the loftiest realms of art, having fixed his mind upon a distant summit, must rely mainly on himself if he is ever to arrive at the height of his ambition. The genuinely ambitious man rarely gets there at all in his own mind. No matter what goal he reaches, there are others stretching beyond, limitless and unattainable.

The student cannot have too much good training if it is applied in the proper direction; the artist always remains a student, ever ready to learn. But I would warn the student that, with the many opportunities and the facilities afforded him in the various branches of certain schools, there is a temptation open to him—and, indeed, in many instances he is expected—to divide his attention too much by joining other classes, all of them excellent in their way, but of no use whatever to the student who is seriously taking up modelling.

He who takes up this art should devote the whole of his time to modelling and drawing, and only those things which have a distinct relation to modelling and sculpture; leaving all other classes to those students who can directly benefit by one or other of them.

The art student cannot expect to become proficient in more than the one great subject during his life-

time, for not alone does he live in a day of specialists, but he has taken upon himself a huge task when he has started on the career of a modeller or sculptor.

Too many students in these schools try to get a smattering of many subjects, and they become "Jack of all trades and master of none." They obtain, perhaps, a little knowledge of many things, and a little knowledge is a useless thing in this case, because it has robbed the student of much valuable time which would have proved of better service had it been devoted to the furthering of his knowledge of one particular subject; for many of the things the students do learn in these schools can be of no use whatever to them in their calling.

What need has a modelling student to know anything about bookbinding, or a student studying figure-painting to take up the hammering of iron or copper work? Very nice work, perhaps, if he wishes to take it up as a hobby, but the artist does not want a hobby.

An artist's every thought and all his energy must be bestowed upon his work, and such time as he has to spare were best spent among the meadows and hedgerows, where under clear skies he can breathe fresh air, which will do him far more good and help him better in his inspired calling.

No one, nowadays, wants to know a little about everything. What would be the value of a medical man who had tried to specialise on a dozen different subjects?

The only person connected with art whose training should have been general, and who of necessity requires a general all-round knowledge of all the arts and crafts, is the principal or head-master. He holds

his position because he possesses this knowledge and is able to see the general working of the whole school. Such a man seldom professes to do or practise any one thing in particular. Therefore he is the right man in the right place, and it is his duty to see that the students should attend those classes, and those classes only, which can be of direct use to them, and from which they can derive the most benefit.

I do not say that some of them are not quite capable artists, and with time at their disposal would not produce fine works; but the set duties, official and general, are too numerous to allow of their practising.

There can be no doubt that the facilities afforded to students in these schools have proved of use, to judge from the number of attendances and the work done; for, generally speaking, it is of a distinctly higher order than the work of students who enjoy fewer advantages.

These schools are perhaps of greater use to the student who is employed during the daytime in one of the trades or crafts, for which instruction is given at such institutions; for here, at night, he may study seriously, from pure love of it, some examples which may be of use to him in the work which he has to execute during the day, in the course of his regular occupation, from a commercial point of view, for a subsistence.

For such students the training and facilities of the L.C.C. schools leave nothing to be desired, and if kept open for them, and them alone, there should be no need of complaint; for the student who has been toiling all day long, say at some work which has been more or less uninteresting or even very tedious to him, and yet goes to a school of art for two or

three hours in the evening to improve himself, is deserving of every encouragement.

For a student who is, say, a stone-carver by day, it would, I think, be a good course of training if he were to follow up his day's work at night with attendance at the modelling class, where he can rapidly improve his knowledge of ornament and figure. There are many reasons why I advocate a change from one material to another, principally that I find if a student is working all day, say, on stone, his vigour becomes less if he continues his studies at night on the same material. But let him take up modelling, and he comes with a freshened appetite for work. Then as he grows facile with the clay he will feel drawn to his evening work, and, come what may, the value of his experience in modelling will be a useful asset to him all his life.

This has been the foundation of many a sculptor's career—stone-carving by day, modelling at the schools by night. To those genuine hard-working students who are anxious, ambitious, and determined to improve, the masters give their time and their interest ungrudgingly. It is satisfactory to know that the facilities afforded at the institutions of to-day are duly taken advantage of and thoroughly appreciated by all students, whether amateur or professional.

CHAPTER III

MODELLING IN ITS ELEMENTARY STAGE AND THE TECHNIQUE

THERE is perhaps no more fascinating or agreeable material to work in than clay, and this chiefly because of its plasticity and the ease with which it can be manipulated. Moreover, it can be made to any consistency, from "slip," which can be applied with a brush after the manner of painting, as is done by the *pâte-sur-pâte* modeller, to such hardness that it needs to be carved or scraped into form. Therefore, naturally, these extremely diverse possibilities place clay before all other materials for the modeller, who can finish his work as highly as he pleases, or leave it merely as a sketch in clay.

But it is when it is in its medium or soft state that it is most pleasant to manipulate—not so soft as to be sticky, nor yet so hard as to resist the touch of the fingers. Once it gets into this latter state it not only loses much of its oily value in appearance, but is past being worked with Nature's best tools, the human fingers.

It is important that the beginner should first learn how to manipulate the clay, how to spread it cleanly over such parts, and in such shapes, as he may wish to make, so that every piece put on shall express something of the form ultimately intended, in a modified degree.

Such pieces should be put on deliberately, and not at haphazard or fingered about carelessly until they find their place. Therefore the student should endeavour to know the form his clay is going to take before it leaves his fingers, and do this without his hands getting all muddied up.

A clever student will soon learn how to model and use a great mass of clay, almost without soiling his hands; whilst another, less advanced, will have his hands so covered that there would be sufficient material on them to make a miniature statue. This is unquestionably bad, because with the hands in such a state the sense of touch (in a beginner) is considerably handicapped, the clay refusing freely to leave the fingers, and the work in consequence becoming dirty in technique.

The student should learn how to build up gradually until he gets the clay to the desired form, and should not pile up a lot of clay and start cutting down; for, properly considered, the method of modelling is building up. In this way the student always obtains the best results. The technique of cutting down belongs to the carver, whose material, stone or wood, must of necessity be larger than the object it is his purpose to make.

Moreover, a student of modelling would not learn as much by cutting down as by building up, for the reason that by the latter principle he is putting on a number of pieces of clay, each piece, almost from the first, bearing some resemblance to the shape which the parts will finally assume. Thus he will understand the shapes and they will become impressed upon his memory; and, besides, the work will be fresher in touch, through all its stages, until the completion.

By this method also the student is not so likely to get lost, for he may, and indeed should, in building up insert into his model little pieces of wood, somewhat the size of common matches, broken, or better still, cut into halves, to indicate the position of certain points and their projections, these points being taken most carefully with compasses or callipers from the particular example he has before him.

For this purpose I advise every student to equip himself with these instruments when first beginning to model, using them frequently and with great accuracy, and applying every other means available to get his work as nearly as he can like unto the original; for with all this help he will have to conquer many a difficulty before he will be able to model or copy well (Fig. 1).

From the first a student should pay particular attention to the importance of keeping his work in a good condition and even consistency, not allowing it one day to be too soft and another day too hard, and taking care that such tools as he may be using are also kept clean.

Unfortunately, most beginners are as careless about these matters as they are about the wrapping up of their work at night, or at such times as they may be covering it and putting it aside for the time being.

They invariably saturate the cloths with enough water necessary to wet treble the amount of material, and throw these cloths over their work with as little respect for what may have been weeks of labour, and teaching from their instructor, as though they were covering so much mud; instead of which the work should be protected from becoming rubbed or smeared, which can easily be done by the careful insertion of small wooden pegs into the clay model,

Fig. I

A Useful Set of Modelling Tools, Compasses, Callipers, and Dividers

or round it, upon which the cloths can hang and still serve the purpose of keeping moist the work under a canopy or covering.

If the work be an important one, it is better to get a wooden frame made, just larger than the work, and lined with some waterproof material (Fig. 2). This can easily be placed over the whole model, which should be sprayed a little every day, and, if made fairly air-tight, will keep the work for a long time in quite a good condition. It is only when the work is kept in such good condition that the student can expect, not alone to progress, but to enlist the interest of the teacher, who never feels any great enthusiasm in a pupil's work when these instructions are disobeyed or disregarded.

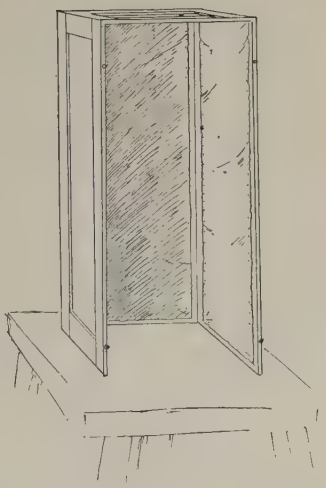


Fig. II

WOODEN FRAME OR CASE, TO PLACE OVER A CLAY MODEL

(Lined with a waterproof material, and closed in with a framework door covered with the same material), to form an air-tight box. In the framework of this door holes are made through which the pegs, indicated in the framework above, pass to hold it in its position.

In starting upon a work, it is better to use clay of a fairly stiffish consistency, rather stiffer than that used afterwards (by the addition of a little water), to model up the parts, for the reason that it binds better round the

armature,[1] making a firmer substance upon which to build more clay, and is also less liable to fall away.

It should therefore be remembered that the clay with which you provide yourself each day before starting to work (that is, supposing you have a work previously begun) should be slightly softer than the body of such work already begun, because when it is being applied, instead of it getting embedded into a softer body, it can be spread, or laid upon the surface, as desired. The only reason for adding clay is to increase the particular part to which it is applied, and not to drive it into the surface.

The intelligent student, with but little experience, will readily appreciate the importance of these points, he himself having so frequently seen others working by different means, almost obstinate in their foolish disregard of these matters, until, failing utterly, they have given up in despair. I am sure few among the many who start modelling would give up, at least in despair, if only they paid attention to the simplest rules necessary to progress.

I recommend any one starting to model to take as a copy a work simple and broad in treatment, defined in shape, and with well-marked planes; examples such as the eye, nose, or mouth of the "David" of Michael Angelo. These can be obtained heroic in size, and are the best things I know to begin with, so healthy and full are they in line and shape, so definite and sculpturesque in form, simple, yet well marked. With these examples the student cannot help feeling hopeful of making a fair copy, and this hopefulness gives him such courage that he immediately begins to manipulate his clay with confidence (Fig. 3).

[1] See pp. 51, 75, 76.

Fig. III

THE MOUTH OF THE DAVID IN THREE STAGES

Note the development from No. 1 to 3.

This confidence is an all-important factor in the student's progress, as he should not start by being timid if he means to be a modeller or sculptor, but must make up his mind to battle; for, as he advances and takes up larger work of greater importance, he will find that a great deal of physical, as well as mental, energy is needed; and although his initial efforts be confined to the simple examples I have named, he will soon discover that learning to model them is not a thing one can go to sleep over, or even sit down to do, as one might toy with a piece of embroidery.

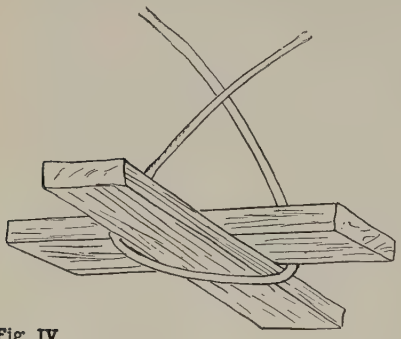


Fig. IV

How to make a "Butterfly," First Stage

In modelling, so many views have to be considered and drawn that you must be on the move the whole time, constantly comparing your work with the cast, from the top, sides, and underneath. The student too seldom does this. He should frequently go down on his bended knees and look up, first at one, and then at the other, and compare his work with the original.

It is also most necessary that he should study the sections of both, for, as a rule, the student too often looks at one view only, namely, the front.

In modelling, a work should be drawn from every conceivable view—for modelling is drawing in clay—and from every point and every direction. The better it is done, the better will be the result,

although I do not say that this alone will produce a great work of art.

"The master" alone can do this, but the student's duty is to learn how to copy well, intelligently, with reverence and with the determination to do his best. This he cannot do until he has learned how to manipulate the clay with freedom, and in such a way as to suggest good technique, or I should perhaps say handling, for, properly speaking, technique is a thing formed after the student has left the class-room and has started to do something original of his own, being left entirely to his own resources, without the master behind him.

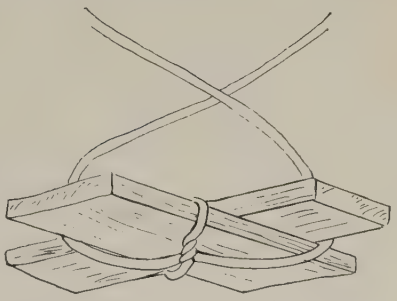


Fig. V

How to make a "Butterfly," Second Stage

A technique (or method of handling) formed and developed at this time is a style of treatment individual to the man himself, and comes about in an almost inexplicable way whilst he searches closely into Nature and into every detail. It is individual, and is necessarily the personal expression of the true artist, whatever medium he may choose for such expression.

When a student has had a course of study from these simple examples, having perhaps built up a bust or other studies from the cast, then the sooner he begins to work from Nature, the better; for the plaster cast is not alone less inspiring than the living

model, but it is more difficult to understand for the beginner. It takes really years of study from the life before he can fully appreciate the charm and beauty of antique great art, whose masterpieces are the examples provided for pupils in most schools of art.

The student cannot be expected to understand these great works, and therefore should not take them as something to copy, but as examples to inspire him in later life, when he has learned something of Nature and her ways. No, it is far better that he should start early to work from Nature, a hand, a foot, a toe, a leaf, a bird, or whatever he pleases, copying these with infinite care, studying their construction, and observing closely their minutest details. Imitate and copy their regularities and irregularities, their true form and deformity—if you choose so to call it—in all their beauty and ugliness—if ugliness you think it is at the moment. When you come to making your selection in building up your ideal, you will at least recognise it with reverence and wonder.

No sooner have you started upon these studies from the living model than you should acquaint yourself with the anatomy: not so closely as would the student who intends to become a surgeon, but sufficient to assist you in the main construction of each particular part, its purposes and influences on surface form. Particularly should you make drawings and studies of, and model, all the principal bones, carefully observing their direction, the position they occupy in the figure, and their proportions.

Supposing, for instance, you are copying a head, a foot, or a hand from the living model, it is more than important that you should, at the same time,

be learning something of its skeleton and its muscular form below the skin by making a model of it, when this is possible. You will then observe the difference between those parts of the skeleton of the human frame which are merely covered with skin, and the more fleshy parts.

The former have a tight appearance, and upon close examination will be found to be made up of a number of small planes or angles, whilst the fleshy parts are looser, and fuller in quality, and rounder.

Take, for instance, the ankle-bones and regard the position of the inside bone compared with the outer one. It will be seen that the one is much higher than the other, and the set-back from the front also of a different distance; but the student's study of the skeleton, at this period, need not be too deep. He need only take a little at a time, and even then such parts only as may be of use to him at the particular moment; but as he advances he will find it necessary to learn thoroughly the exact shapes of such bones as are always seen, at some points, even upon the

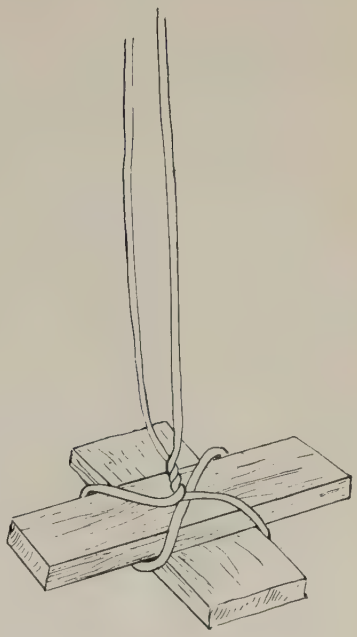


Fig. VI

A "Butterfly,"
Third Stage.

fleshiest of models—the patella, the pelvis, the clavicle (or collar-bone), the scapulas, the tibia and the fibula, the radius and the ulna, all of which, at some time or other, are seen and exert their influence on the surface of the figure, and are clearly defined in their shape.

By knowing these thoroughly, the student will be greatly assisted when he has to build up his armature for the whole of a figure.

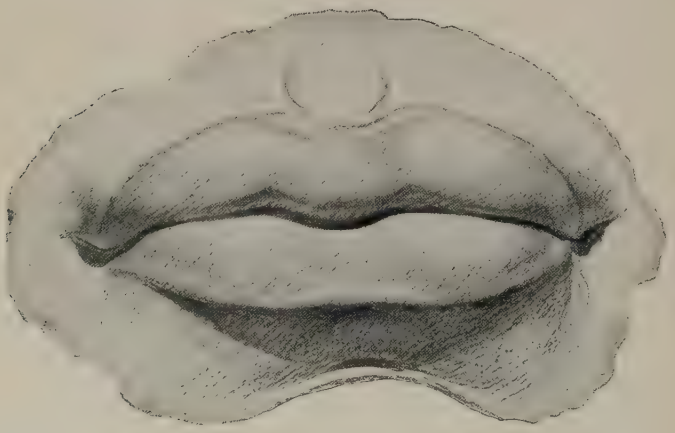


Fig. VII

THE MOVEMENT AND PLAY IN THE LINES OF THE MOUTH

A student may not wish to become a figure modeller or sculptor, preferring the study of animals or foliage. Even then the same principles apply, and a knowledge of construction of those parts beneath the surface is necessary to obtain a successful result.

Who can expect to produce anything really great

with but a superficial knowledge? We have to wrest Nature's secrets from her by ceaseless watching and patient study, before we are able to reveal the beauty of her mysteries to others.

Apart from its service to the student, the search after the knowledge requisite to his art will prove delightfully interesting, and as enjoyable as it is instructive. He will gladden at the beautiful forms and shapes which are somewhat hidden beneath the skin.

It is the artist's privilege to discover beauty in much that others call ugly, and the student would do well to cultivate an ambition in this direction, endeavouring to enjoy every phase of Nature, as he should enjoy everything he has undertaken in his work.

With this sense of self-surrender, out of pure love for his calling, he will find no tedium in its performance, but without this enjoyment in it the work becomes cold and lifeless, a mere perfunctory task, not worth the time expended upon it.

It is far better for a student to relinquish any work in which his heart is not wholly centred, and to start something fresh, than to continue that which at each new attempt becomes more and more distasteful to him.

CHAPTER IV

MODELLING A PORTRAIT BUST

ALMOST the greatest gift a portrait painter or sculptor can wish to possess is that of being able to catch the portrait or actual likeness of the sitter. This faculty needs a different training to that of the artist who produces ideal works, and whose great ambition is to get perfection of form, of rhythm, of line, and a beautiful sense of feeling and composition, born of the beauty which exists in his own mind.

In portraiture it is absolutely necessary to study the type and character of one's sitter in all its idiosyncrasies: to write, as it were, indelibly in clay or stone, the man's history as it is written on his physiognomy; for truly on every feature is carven, to a greater or less extent, his past and present, and particularly are those parts developed which have been most brought into constant action.

Let us take, for example, the preponderant brow of a Napoleon; the lips of a Demosthenes, instinct with divine oratory; the almost ideal profile of a Byron or Shelley; and contrast these with the jaw, heavy and underset, of a pugilist.

One has only to look at a group of professional men gathered together—barristers, doctors, actors, musicians, orators, and artists—to detect that each one among them has a distinct and separate entity according to the particular profession he follows;

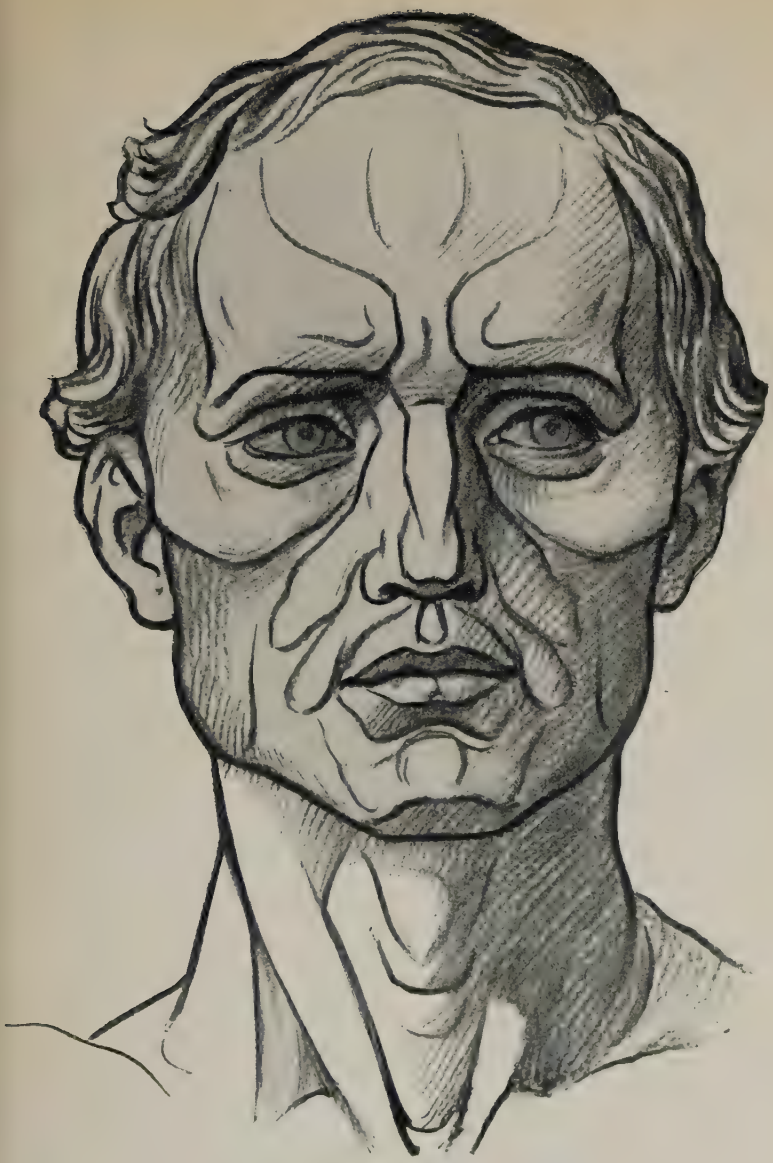


Fig. VIII

SHOWING THE GENERAL LINES AND MASSES TO BE OBSERVED WHEN BUILDING UP THE HEAD

and although they may not be specially gifted in any of the various branches they represent, still the constant exercise of certain muscles and expressions must become more noticeable, as the muscles do in the legs of a dancer or runner, or the biceps of a gymnast. In the same way, the exercise of intelligence develops to a marked degree the characteristics of its possessor.

All students of physiognomy are agreed that a man in time becomes, more or less, like the people with whom he is in constant association. This fact is especially to be noted in married people, who have lived in harmony together for many years; and also in a distinct resemblance to his *confrères*, in action and manner, of the artist, the musician, the preacher, and the actor.

Never could we confound them with the butcher, baker, clerk, or butler, or even the prosperous city merchant; yet each alike has marked characteristics to the physiognomist, and all are equally interesting types of humanity to the painter and sculptor.

I have indeed seen men grow like unto their dogs when they have been particularly attached to a certain breed, as others come to resemble their best fancied birds, in an almost comical verisimilitude.

These are traditional characteristics from time immemorial, and I remark upon them only to show how intimately the portrait painter and sculptor should study each detail in the facial expression of all and every type of men with whom he comes in contact.

> "The maniac's form we turn with loathing from,
> Became immortal in its agonies
> When Michael Angelo prisoned it in stone!
> And peasants rough, uncouth, for ever live

As Millet fixed them with his deathless Art.
So all the ancient myths of Satyr, Nymph,
Goddess and Dryad, are alive to-day
In classic silences of Greece and Rome.
Beauty is fleeting, but the sculptured form
Endures through ages—ever beautiful."

Whilst the caricaturist seizes upon some salient peculiarity of physiognomy and exaggerates it, until the portrait may be said to be more like the original than is the caricatured person to himself—yes, laughably so—the student who intends taking up portraiture may take a lesson, and indeed learn much, from examining the best specimens of the caricaturist's art, although in his own work he should most carefully avoid exaggeration; for caricature in portraiture proper would rightly be considered vulgar and in the worst taste.

The difficulty of avoiding exaggeration on the one hand, and tameness on the other, is a great test of the power of the artist, who, if he be clever enough, will infuse a "subtlety" into his portrait, a success which can only be attained by a close, careful, and constant study of the features and expression, a ceaseless observation of the varied types of features he sees everywhere around him. He must note the contrasts each presents to the other, and endeavour to form in his own mind some idea of what their respective callings, trades, or professions may be; and though he may never have any proof of the correctness of his surmises, he will thus be trained in the habit of minute observation.

When a student is about to start upon a portrait, either a bust, statue, or statuette, he usually knows something of his sitter and his calling in life. He

therefore looks out for indication of this something denoting his calling.

It is not often that a man or woman is asked to undergo the ordeal of sitting for their portrait, in clay or marble, until they have in some way or other become distinguished; and their personality and character having been developed, the sculptor will experience less difficulty in seizing instantly upon their characteristics.

It is different with the portrait painter. He may paint a young girl solely by reason of her prettiness and exquisite colour, though she herself be utterly devoid of any marked character or fine form, whilst to the portrait sculptor true or fine form and character are all-important.

I advise all students, when choosing a head to model from for practice, to select one with well-marked features, an old man for preference, and, when possible, one with little or no hair on his face, clean shaven, so that the jaw, chin, and upper lip, in which so much character lies, may stand clearly forth, undisguised by beard or moustache. A face three parts hidden by hair is not the sculptor's ideal for clay or marble.

In building up a bust, the student has first to provide himself with a modelling stand, one with a revolving top, and also with what is called a "bust" peg (Fig. 9), which is an upright piece of wood about 14 inches high, 2 inches square in thickness at bottom, tapering up to about $1\frac{1}{2}$ inches square. This is inserted firmly into a flat board or platform, about 18 inches square by 2 inches thick, which is made so that it will not warp or twist with the moisture from the wet clay. Near the top of this upright peg fix a couple of pieces of lead or compo

Fig. IX.

BUST PEG SHOWING "BUTTERFLY" SUSPENDED BY A PIECE OF WIRE FROM WHERE COMPO PIPES CROSS OVER ONE ANOTHER

Note piece of wood to carry shoulders. From this, "butterflies" can be suspended when thought necessary.

tubing as shown in Fig. 9; and from where these two pieces of tubing cross, hang what is called a "butterfly"—two pieces of wood bound together by copper wire, in the shape of a Latin cross. The "butterfly" is suspended from above, and left to hang quite freely, so that it may easily be pushed from one side to the other, should it project too far out at any one place, when the clay bust is built up, or during its progress of being built. The purpose of this "butterfly" is to carry the weight of some of the mass of clay in use for the head; whilst the advantage of the piping is that it gives or moves quite easily if it be thought desirable to turn or change the action of the head, after the bust is commenced. It also retains the ease in the poise of the head on the shoulders much better than if any material less pliable than lead piping were used.

It should be remembered that the appearance of ease in the growth of the neck out of the shoulders, and of the head thereon, is very important.

If it is intended to model the shoulders or draperies out any distance, which may need an abundance of clay, it is advisable to nail a piece of wood across the upright peg in the direction of the shoulders, as this will carry and support the clay; from this may also hang more "butterflies."

We will now suppose that the armature is ready, the clay prepared, and the model or sitter arrived. He shall from the first, and through all the stages, be seated at such a height that his head and the one being built up in clay are as nearly as possible on the same level. Before settling on any definite pose or attitude of the head in relation to the shoulders, it is always as well to allow your model to place himself in some position natural to himself, which he

will undoubtedly do, if he be sufficiently interested in some agreeable conversation to lose his self-consciousness.

You are then more likely to catch him in some characteristic attitude, and likewise with his natural expression. Whilst he remains in this pose, view him all round to make sure that he appears equally interesting and well-balanced from everywhere, and that no alteration will be necessary in the armature.

Particular attention should be paid to the armature to see whether any change is necessary, whether it requires turning or twisting in another direction to that in which it now is, so that it may better serve its purpose, always remembering that it must be well within the mass of the head, and also at its narrowest points, so that the full amount of clay, which is to contain the features, will leave the (armature) lead piping below the surface.

When due consideration has been given to this, then a start may be made upon building up the clay. Squeeze or press it well round the lead piping and woodwork (which previously cover with a little water to make the clay stick to it), forming it roughly into the shape of a skull, in a direction suggesting that of the poise of the head of the model or sitter, especially in relation to that of the shoulders.

Then set out a line up the middle of this skull shape, and others horizontally on this line, about the position where brow, nose, and mouth will come, for upon these lines the perfected features will be built (Fig. 10).

It is all-important, in the earlier stages, that the position of the pit of the neck be taken, as the projections of the features of the face are judged and

Fig. X

Showing First Clay Stage

Horizontal and perpendicular lines indicating brow and mouth and central line up face and through middle of the features. Also position of the pit of the neck.

governed by this point, in the hollow or pit of the neck.

Great care must be exercised to avoid setting this point in too deep, or bringing it too far forward, on account of the thinness of the neck and the necessary thickness of the armature through it (the neck), and up into the head.

From this point the distance through to the back of the neck, *i.e.* to the seventh cervical, and to either shoulder may be obtained.

It will be noticed that the projection of the chin and face from the pit of the neck varies considerably, according to the tilt of the head and to the position in which a person is sitting. There may, indeed, be little or none in front of this point, when a person is leaning or sitting with his head thrown far back and chest brought forward; whereas, if posed with the head and shoulders forward, the features are naturally much in front of the pit. Therefore this point should be taken, as I have already said, during the earliest stage, as soon, indeed, as the sitter is in the correct position or pose which you have decided upon for the clay bust.

When you have made quite sure that the position or attitude of your sitter is as you desire it, and have fixed upon a point in your clay for the pit of the neck, from this point take the first point in the features—that is to say, the chin—and from this same pit point its projection out or forward, as seen in profile, by means of a plumb-line held up against the chin and the distance in to pit, taken with a compass or pencil held horizontally.

This measurement cannot, however, be taken in the way here indicated if the head is turned to look much towards or over either shoulder, as in such a

case it must be judged only by the plumb-line, which must be held as you would hold it to obtain the projection in making a drawing on paper from the model.

The same means should be applied in getting the position of the chin, in relation, vertically, to the pit from the front view.

The plumb-line may frequently be of use, although this, like all other means of getting points or relative positions, must be used with care and extreme accuracy, because in holding up a plumb-line it is the easiest thing imaginable to get very wrong if you happen to stand a little more to the right or to the left (when trying it on your clay) than you stood when deciding it on your sitter.

The point of the chin having thus been obtained, it can be used as basis for further measurements, which must be taken very carefully from the sitter, and set or marked out on the clay model with small pieces of wood, like matches, these being inserted to indicate more surely the position of the points. These little pegs can be pushed in or pulled out to increase or diminish the distance or projection, should this be found necessary, so that they may correspond to the measurements on the life model, if it be discovered at a later period that a measurement has been incorrectly taken.

All measurements should be taken from well-defined parts which are not likely to alter much by a change in the expression or countenance of the sitter.

It is very advisable to take the following points: from the centre of the chin to the top of the nose between the brows, and then from the chin to the projecting pieces of flesh (called the Tragus) on the sides of the face next to (and part of) the ears directly

above the lobes; the width across the face at these points; then again from these points to the tip of the nose, and the projection between the brows over the nose; then from either of these last taken points to back of head. The further points to be taken are the extreme width across at ears, temples, cheek-bones, jaws, as also across eyes at outside corners; size of ears, length and width; distance up from centre of chin to the inside corners of eyes; length from under chin to top of forehead and top of head, but into these last-mentioned measurements pegs need not be inserted in the clay.

It is safer, when you have several points correctly put in, to use these all in taking further measurements or points, as in doing this you are not only testing each and all, but you are sure of getting them in their relative places, with greater accuracy and speed; for it must be remembered that from any three given points any other may be obtained by striking out from each a portion of a circle. Where these circles intersect, or cross, must be the mean distance.

Numerous other measurements may be taken, but those mentioned are the most important for the correct modelling of the face.

Never depend upon measurements taken from one side of the face to serve for the other side, because it invariably occurs that they differ somewhat, and thus the nose and other features are pressed a little out of the centre, sometimes to a marked degree; these differences are not only interesting, but go a long way towards making the characteristics of the sitter.

Then, again, it will often be found that one eye is not only set deeper in the head, but in some instances

higher up or lower down than the corresponding one; perhaps, too, one corner of the mouth will be lower and deeper than the other; but by all means avoid any exaggeration of such differences, as your face will easily look all askew. Any little exaggeration will be clearly seen by viewing your work in a looking-glass, and I strongly recommend the constant use of this means of discovering faults; more especially as the work becomes advanced, look at both sitter and work in the mirror, comparing both.

The student is advised to note down the measurements of the sitter on a sheet of paper for future reference, in order to save his sitter the annoyance of repeated touching with the callipers.

When the student has taken note of a fair number of measurements he may go to work a little more freely, modelling or building up anatomically the bony structure of the face and head, leaving the fleshier parts until a little later.

On no account should he work too long, from any one view, without turning both the sitter and the clay model; it is most advisable to turn both round at frequent intervals. Looking too long from any one point of view is an error far too common with most of us, and one which invariably causes us much trouble in undoing, with consequent loss of precious time, besides bringing about greater difficulties, such as setting back, or having to cut away—an always troublesome task which tends to depress and discourage the beginner. Besides, it brings about a different treatment and manipulation to that of going straight ahead, as in the case of the building-up method or principle.

The next, and final, stages (Fig. 11) have few if

any limitations as regards the amount of time or finish that may be spent upon the portrait bust; but I should strongly advise the student to carry his work as far as he possibly can whilst he has interest

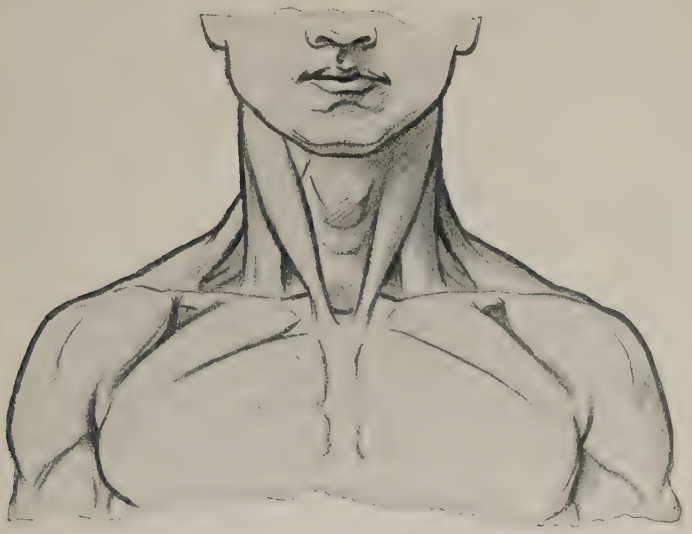


Fig. XI

SHOWING THE PRINCIPAL MUSCLES IN THE NECK WHICH GO TO SUPPORT AND EFFECT THE MOVEMENT OF THE HEAD

Observe the strength in the arrangement of these muscles which make this column-like form, and the decorative character of the same.

in it, studying and modelling very closely every little detail, learning its direction of growth, imitating its movement, and using every endeavour to put into his work the value of the numerous flat planes as contrasted with the more rounded parts.

On close examination it will be seen that all the

features, more particularly the bony parts of them, are made up of an enormous number of small and varied planes, some slightly fuller than others; but seldom, if ever, is any part found so rounded in its

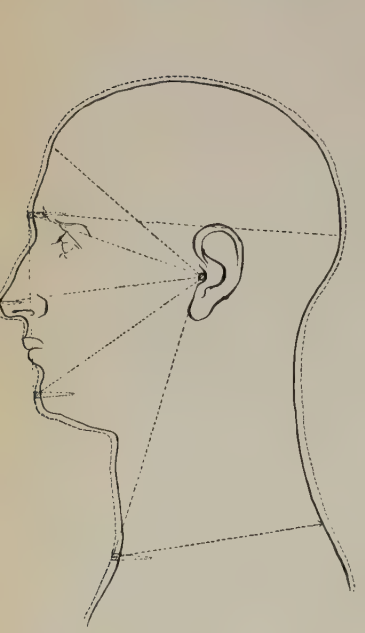


Fig. XII

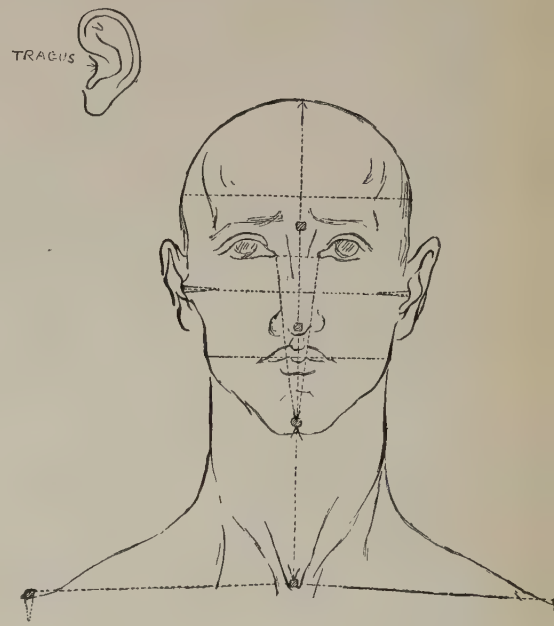


Fig. XIII

DIAGRAMS SHOWING POINTS FROM WHICH TO TAKE MEASUREMENTS AND HOW TO PUT IN THE PEGS

form as to suggest that it might have been turned on a lathe.

The growth of each and every muscle is varied in direction; it is never monotonous.

It is when these things are not attended to, or are missed, that a bust looks empty and uninteresting.

A change in the light on your sitter and on your work will be of considerable help in finding details. A strong top light is good for searching out minute details which undoubtedly would otherwise escape observation, although it may be remarked that this is not the light which is generally supposed to flatter the sitter in the minds of the outsider or relation, who prefer to see a more direct front light upon it, that obliterates entirely the details in a face.

Fig. XIV

Note the flat plane in the shadow leading up from the wing to the tip of the nose.

It is important that every piece put on should not only be considered, but looked at and judged from other views, even from underneath, at the time of putting it on; otherwise it is more than likely that it will be found, when seen from a new outline, that time has been wasted, as well as much worry brought about, because it will not look right, for some reason difficult to understand or ascertain.

Every bit of modelling, especially in the round, means the drawing of an object with innumerable outlines, each of which requires to be correctly drawn; if it be not, the result is certain to be wrong.

The difference between the character of the drawing and modelling of the fleshy or muscular parts and that of the bony construction, where the bone-

Fig. XV

THE HEAD WITH ITS PRINCIPAL MASSES PUT IN

It is now that details should be modelled into these masses to obtain a smaller scale, after which subtleties in the modelling should be sought after.

forms are seen on the surface, is considerable. It is therefore a matter to be studied most carefully.

The position of the inside corners of the eye, and the modelling around, cannot be treated too conscientiously. The neglect of these parts, and of the hollows everywhere, invariably brings much unnecessary trouble. Such trouble is bound also to ensue

Fig. XVI

THE DRAWING OF THE EYELIDS AND PARTS AROUND THEM AS SEEN FROM A SLIGHTLY LOWER LEVEL

if too little attention is given to the sections of the face as seen from underneath and above.

To some extent the modeller and sculptor must view his sitter as the painter does, in order to obtain the relative colour or tone of part to part, and therefore he to some degree runs astray in places from the true form. Especially is this so in treating the eyes and hair, which in one person may be very dark and in another quite light. For this reason

some difference must be made if a close resemblance to the life is to be obtained. Blank eyes seldom look intimate, especially with our modern realistic treatment in portraiture, and so we endeavour to get the relative colour value by cutting in or hollowing out the pupils to such an amount as to resemble the depth of the colour of the eyes of the sitter or model; in fact, we go so far as to incise lines to indicate the rings in the pupil, and a spot or deeper hole in the

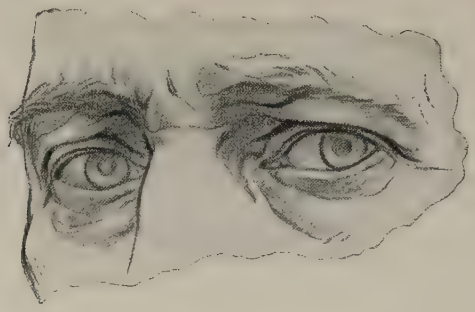


Fig. XVII

THE DRAWING OF THE EYES AND THE PARTS AROUND THEM AS SEEN FROM THE SAME LEVEL

centre to resemble the dark spot in the middle of the pupil; and further, in some instances a little projecting bit of clay is put in the pupil, above the dark spot just spoken of, to get the effect of the angular-shaped high light generally to be seen on the eye. This cutting in of the pupil not only serves to get a dark effect, but helps by its contrast to make the white part of the eye appear even whiter.

In treating the eyes in this way care should be taken to avoid making them look like holes cut in the clay; it is not necessary to dig very deep to

obtain the appearance of the darkest eye, and the effect of light eyes can be got by very little sinking. An incised circular line alone serves to give the effect in some cases; but you may try a dozen times before the resemblance is good.

The correct effect is not obtained by one dig, as may be imagined, but requires studying as all other parts do. And it should not be regarded as a trick. It must not be thought that the making of a hole or line in the eye does anything more than give something of the colour or tone; it cannot even give you the correct direction of sight, unless the upper and lower lids are correct in their construction over the form of the eyeball. But if the lids are properly constructed and properly drawn, especially as seen from underneath, then the direction of sight will be easily observed; and there is no need to indicate the pupil, unless it is for the purpose of relative tone or colour.

As the sight moves from the middle to the inner or outer corner, so it affects the lids very considerably, and you will observe, by looking from underneath at the eye, that, as the pupil moves to look either inward or outward, the lid follows the movement. The flesh of the lids stretches over to the greatest projection, which is the centre of the pupil.

The hair also has to be regarded as colour, and this colour taken into consideration, though no laws can be laid down as to the modelling of hair, for almost every man has his own particular way of treating it.

It can only be regarded more or less *en masse*, the difference between light and dark hair being obtained by undercuts of more or less depth.

Of course, in dark hair one would naturally keep the hollows deeper, and cut in such a direction as to

Fig. XVIII

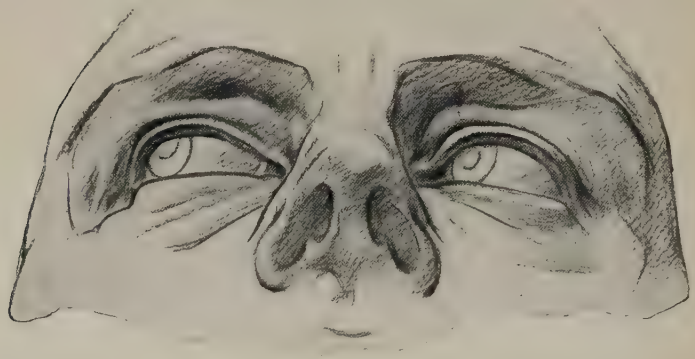


Fig. XIX

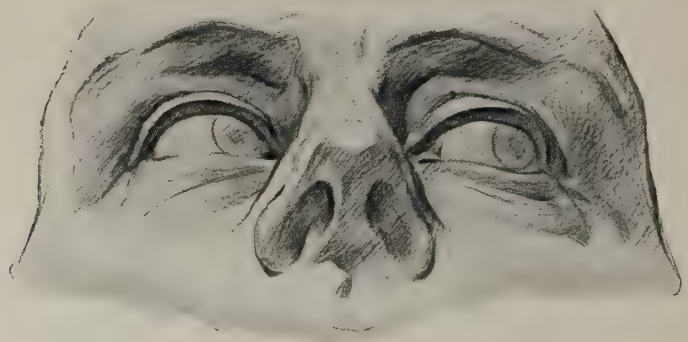


Fig. XX

THE EYES AS SEEN FROM UNDERNEATH

Observe the drawing of the eyelids, and the change brought about by the movement of the pupil.

obtain as dark a shadow as possible, and it might be more cut up; whereas with fair or white hair the hollows would be kept shallow, and undercuts would be avoided as much as possible, whilst the detail should be kept very quiet.

In dealing with the hair, whether on the head or face, take care not to cut into the skull or fleshy parts; this too often occurs in students' work. Let the drawing and construction of the head and face be felt through where they have hair covering them. Hair is always a very difficult thing to treat, and I cannot do more than advise the student to regard, to study carefully, the drawing from all views of the general mass and its minor masses; the growth from where it starts, and the movement it takes to the end; the shapes and design of the masses. Note also the parts where

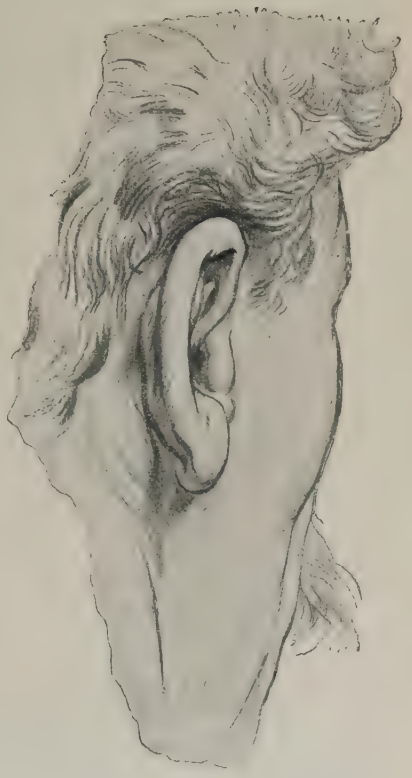


Fig. XXI

THE DRAWING AT THE BACK OF THE EAR, TOO OFTEN NEGLECTED BY STUDENTS

Fig. XXII

A Sculpturesque Treatment of the Hair

Showing the beautiful shapes in the masses and detail.

Fig. XXIII

A Study of the Hair, showing the Decorative Character to be found in the Hair

Note the lines and masses. See how definite these are.

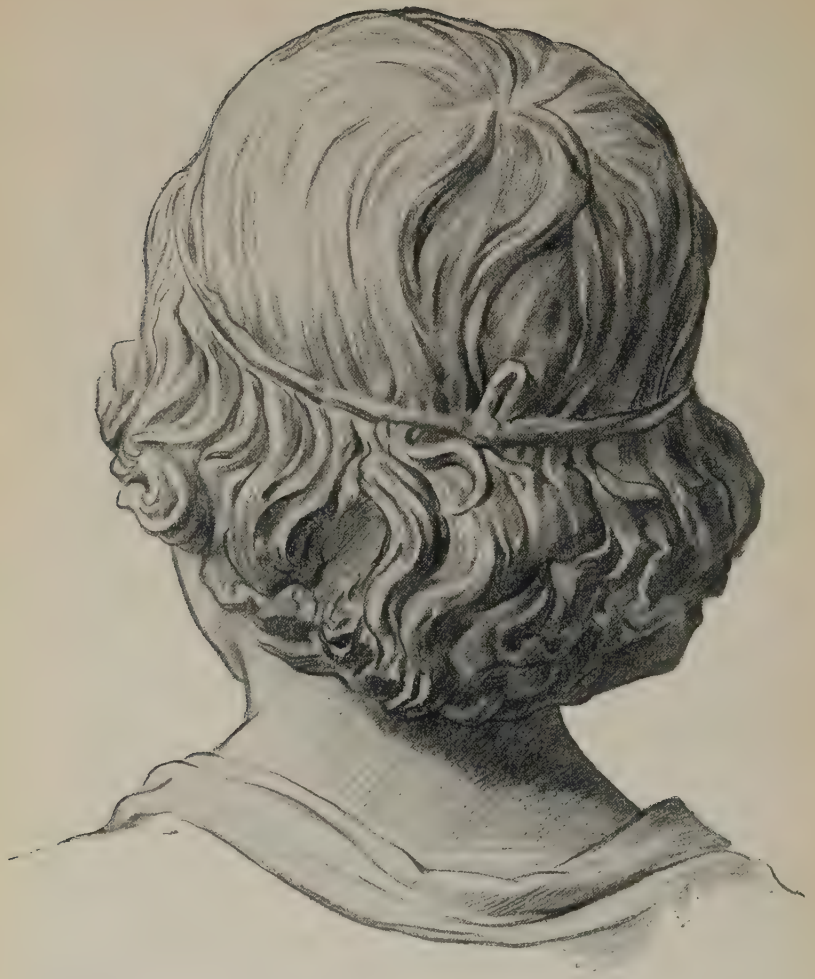


Fig. XXIV

THE DESIGN IN THE HAIR AS SEEN FROM BEHIND

Note the radiation of the lines from the crown.

the start of the hair is seen from the skull, as on the temple bones, and contrast these with the direction of growth of the masses hanging over, which perhaps do not expose themselves at their roots.

View from the back of the head the manner in which the hair grows out from the crown, radiating from a centre, and forming a beautiful design. The back of the head is rarely studied as much as it should be. It is a very characteristic part, and should be regarded seriously. Most people are recognisable from the back of the head, which goes to show the importance of studying that part.

Nine times out of ten the ears are grossly neglected by the student, and are in almost every case made too heavy. The ear is a very delicate shell, in parts very thin and transparent. A general fault is to make the hollows too deep, which makes them look too black; the shadows in the ear are never black, by reason of the hollows being so beautifully clear and shallow that they collect light.

The ear should be drawn from the back and three-quarter view, as seen from behind. This is also a most useful view from which to study the whole of the outline of the face.

CHAPTER V

BUILDING UP A FIGURE OR GROUP IN THE ROUND

It is with the group or figure in the round that so much work and care is needed in the beginning, when building up the armature; for unless this is properly started and put up with the utmost correctness, it is sure to cause serious trouble later on, and perhaps despair. The narrowest parts are so very narrow—as, for instance, across the wrists and ankle joints, and in the fingers—that the adjusting of such armature as may be necessary for these parts is a matter calling for extreme care and minute calculation, without which the armature will be found to be out of the centre of the parts, and thus fail to serve its purpose properly. The importance of this exactness in the adjustment of the armature will be more plainly seen when it is pointed out that, through such of the parts as I have mentioned, it is necessary to use a lead or compo piping, or maybe iron, almost as thick as the parts themselves, so that there is but little clay covering the surface of the armature when the work is finished. Any miscalculation will lead to the armature being exposed outside the outline of the clay, which is a sure proof of bad craftsmanship.

When lead or compo piping or other pliable material is used, as may be the case in small works or anything under life-size figure proportions, the

difficulty in rectifying an error, or making any change in the armature which it may be thought desirable to effect, is not nearly so great as it would be in a work of greater proportions where it is necessary to use iron rods, in place of the softer material, for strength and for the purpose of preventing any movement or change being brought about through the weight of clay or for other reasons. In setting up the armature, it should be borne well in mind from the first that it shall be so arranged as to pass as nearly as possible through the centre of all the parts. It must serve as the skeleton upon which to build the flesh. It is advisable to connect to the piping in the arms, *i.e.* at the extreme ends, twisted wire to carry the fingers, though this may not be absolutely necessary if the hands are closed or attached to a body or other mass. But when the fingers are disconnected and extended, or in any way parted from one another, it is certain that they will break off many times before the work is completed, unless wire has previously been put in to carry them.

Build up a good skeleton of piping, &c., and you will have an excellent armature upon which to model a figure. Bend the piping and wire in the general form and direction of the bones, and tie to it pieces of wood to carry the larger groups of muscles or the heavy parts of the body, where masses of clay will be required. The wood will keep the work lighter and serve as a basis for building up the clay. It will also be less likely to fall down—a contingency against which it is advisable to take the further precaution of suspending butterflies from any parts of the armature that will permit this useful expedient.

A well-put-up armature should exactly give the action and the general proportions of the work to be

carried out. For this reason no time or care should be spared in putting it up thoroughly well, for it will be found a gain in the long run (Figs. 25 and 26).

Where the lead piping in the limbs or other parts will not allow of any wood being introduced on account of the narrowness at such points, it is advisable to bind or twist copper wire round it (not too tightly). This will form a ledge or key upon and around which the clay can tighten, and will thus serve to hold up the weight; for lead or compo piping, being of a very smooth surface and round form, does not hold the clay firmly in its place, and soft clay has a tendency to turn or move round while you are working upon it unless something has been done to prevent it. With an armature fashioned in the manner which I have suggested, and which is shown in Figs. 25 and 26, the student may set to work to build up the figure. I must point out here that it is a wise plan to give sufficient depth to the groundwork or clay base upon which the figure will stand, for it may happen that you desire, or even find it necessary, to lengthen your work, which cannot be done by extending the top portion of the figure without considerable difficulty. On the other hand, it will be found quite a simple thing to lengthen the legs by cutting a slice off the top of the base, and then pressing the feet down to the new level.

The first measurements to be taken are :—

1. From ground level up to pit of neck (*i.e.* top of sternum). This measurement being so long, its exact half length is usually found; this is put on the reducing scale, and the result afterwards doubled to give you the full relative length from ground to pit on your reduced work.

Fig. XXV

AN ARMATURE MADE OF COMPO PIPING FOR A STATUETTE

Note the main iron support is bent in a direction to follow the line of the body and to pass through its centre.

2. From ground level up to patella, on standing leg.
3. From patella to anterior superior iliac process.

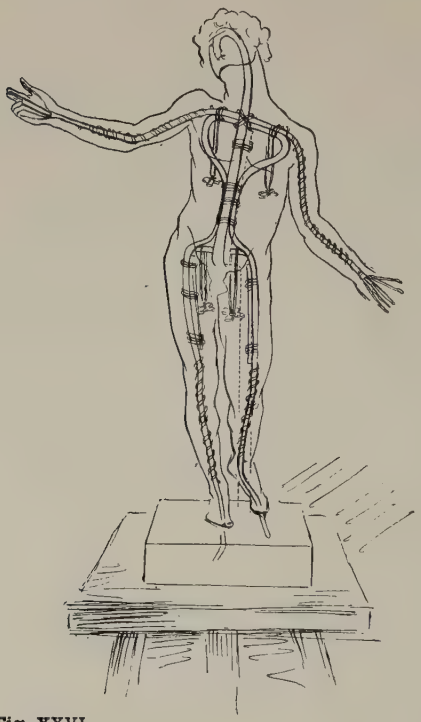


Fig. XXVI

THE ARMATURE COMPLETE

4. From this last measurement across to opposite anterior superior iliac process.
5. From anterior superior iliac on standing legs to pit of neck.
6. From pit of neck to top of skull.

7. From pit of neck to tragus.
   Then up the opposite side of figure to the corresponding points, starting with the point from ground level to patella.
8. From patella to tibia at anterior joint, on both legs. Further measurements to be taken:
   From pit of neck through to seventh cervical vertebra.

This, it will be found, is rather higher than the pit, and its exact position above this point must be obtained by means of a straight-edge held horizontally and on the level with the pit, as seen from profile.

Down from seventh cervical to posterior iliac processes.

Distance across iliac processes and through from each of these to anterior iliac processes.

From pit of neck to extreme end of either clavicle.

From the acromion process or end of clavicle to the head of ulna.

From head of ulna to end of radius and ulna at wrist.

From the two last-named points to the first articulations of the fingers. And then to further joints in fingers.

From all the main points many further minor, though important, points may be taken. You cannot be too careful in putting in all these points accurately.

The student will find it an excellent plan to compare measurements with one another. This will not only be interesting, but also instructive, although they must be regarded more or less as approximate only. They are not to be relied upon altogether, but will serve to point out something of the relative

proportion; and they are of great assistance when a figure has to be put up without a model.

Having obtained most of the main points, you may begin to build in between these (Fig. 27). Be very careful not to put on a great amount of clay, or so much as to be anything like the size the parts will be eventually, *i.e.* when finished.

By all means content yourself with letting the work grow up gradually, and under no condition get a lot of clay round the joints at the ankles and wrists, an error too frequently made by students. It is better to err on the side of keeping these parts rather thinner than they are in nature (in proportion) until almost the finish; but in the end have them the exact size, and measure through at such points to the greatest nicety.

It is advisable from the very start of putting on the clay to build up your figure in proportionate quantities all round, so as to get a general covering. Avoid the mistake so often made of working too long from one view, but have the model and your work frequently turned, every fifteen or twenty minutes for the first day or two. When you have something like a general resemblance of the life model, but in a much thinner state, you may put in further points.

The pegs I advise you to use for indicating the points should be made rather thicker than a common match and about three-quarters to one inch long, square at the top and pointed at the end which is to be inserted into the clay. These pegs should be pushed in to their correct distance, and always pushed in directly from a front surface, and not carelessly at any angle (see diagrams 12 and 13, page 60).

The reason for using these carefully made pegs is,

Fig. XXVII

First Stage of Building up a Figure in the Round

It will be seen that the figure is developing equally all over, and that no one part is being neglected whilst another is advancing. Note that the pegs at points are carefully put in and are to be clearly seen. Observe the position of each point in relation to its corresponding one.

that they form a firm surface upon which the points or legs of the callipers can rest firmly without getting embedded in the softer surface of clay; for points made on a clay surface would not only get easily lost, but would always be unreliable.

The student may now continue to build up be-

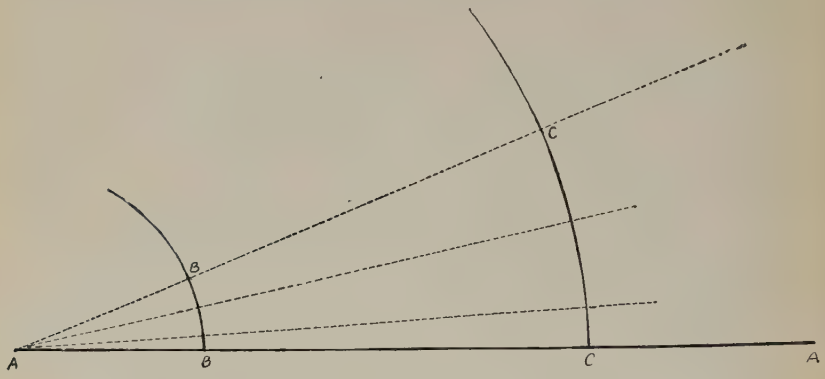


Fig. XXVIII

An Enlarging Scale

Draw a line A; describe arc B. Mark off on this arc half the height of your model, and if your work is to be enlarged to three times its size, set off three times the distance A B along line A; then describe another arc C.

Draw a line from the point A, through arc B, at the point previously marked off, and indicating half the size of your model; continue this line up through the arc C.

Strike off all measurements taken from the model on the arc B, and draw lines from A through these measurements, continuing these lines until they cut through arc C as shown by dotted lines.

Then the distance from C on line A to the point where the line cuts through arc C is the enlarged measurement required.

tween the points (though not covering them), by putting on the muscles in as correct a manner as his knowledge of anatomy will allow him.

If the student knows but little of anatomy, he had best learn more with as little delay as possible, for he will find, as he goes on, that the more he knows the quicker his progress will be, and the better and more intelligently put up will his work appear.

As I have said in another chapter, it is most essential that the artist should have a thorough

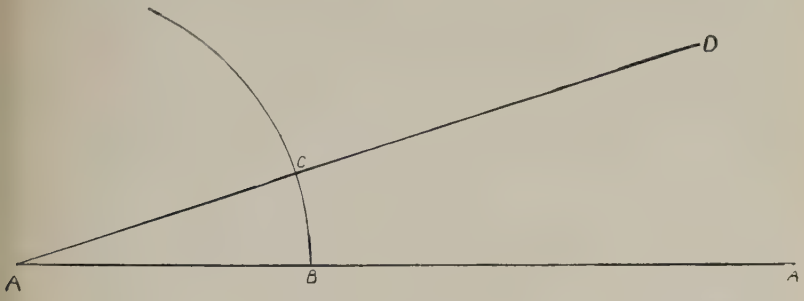


Fig. XXIX

A Reducing Scale

Draw a line A A. Take half the height of your model with compasses, and strike an arc as shown at B. Then take half the height of your proposed figure, and measure it off on this arc B C; next draw line A D cutting through C. When taking measurements, strike off each one in this way, taking A as a centre, and the distance from the point of intersection on the line A A to the point of intersection on the line A D will give you the size required.

knowledge of the anatomy of everything he undertakes.

It is very necessary to study the sections of the model from underneath and also from above. Much can be done at all stages with constant attention to these matters. It is only from looking down upon the shoulders that you can judge the shape made by the clavicle and scapulas. If you cannot get to see

the model from above whilst he is on the elevated throne, get him down on to a lower level. Consider how well you get to know the plan of the horse from the top of an omnibus. We study too little the human form as seen from above and below. We usually and quite properly pose the model on a higher level than ourselves, but it is well to see the model at other levels also. The figure modeller or sculptor should know the form from every conceivable view, for he cannot complete a figure in the round until he has every section of each particular part correct and true in all its views. This applies also to the innumerable details, made up as they are of many varying outlines, each and all equally beautiful and requiring to be mastered.

The student cannot do better than study carefully the grand shapes formed by the groups of muscles; he will, in fact, do well in remembering that all nature provides the loveliest shapes, and designers must look to her for the best patterns.

Though I strongly urge the student to build up his work anatomically, it should not in the end look like an anatomical figure cut up, as it were, but should be a complete whole.

It has been said that there is not a straight line in the human form. Truly nothing with life in it, and nothing that has possessed life, could have a line in it so straight as the one made with a straight-edge. Nature's lines have a living quality which will never be formed in a mechanically drawn line—a certain fulness, contrasted by beautifully clean, full hollows.

The student pays far too little attention to the hollows, making them usually small and invariably too deep. I cannot too strongly urge upon all who

study modelling the great importance of giving due consideration to these parts. A figure can never hold together, can never possess its full rhythm of line, and must ever look not only lumpy, but empty, unless the hollows are properly modelled. To get the depth and drawing of these hollows, it is an excellent plan to place a straight-edge upon the muscles or parts projecting on either side above such hollows as you may wish to see. It will often be a surprise to you to find how shallow parts are that looked quite deep, and when the figure upon which you are working is a reduction, say, to half the size of nature, the hollows must necessarily be half the depth, so that what would appear fairly hollow in life-size will be quite shallow in half life-size.

The method I have suggested for obtaining the depth of the hollow applies to such parts as cannot be seen in the drawing on the outlines, though this method may be applied at times to all the outlines. It will enable you to judge and understand the shapes enclosed within these lines. All nature is extremely subtle. It is never cut up to the extent the student makes it, and this chiefly because of the drawing and modelling in the hollows between the projections all the bones and muscles and tendons are brought together, veiled with the skin, and form one complete and harmonious whole.

Note the simplicity and breadth of the hollows in the finest examples of Greek sculpture, or, indeed, in all the best sculptured works, both ancient and modern. Every part, as well as the whole—the face, the hand, and foot—must look poor and wanting in richness till these things have been given their proper attention. The fulnesses only get their proper

value by contrast with the true value of the hollows, and if the student would only bear this in mind, his work would more speedily progress, and less frequent would be his fits of depression and his anxiety to find out what is wrong with his work.

Another and very important matter the student will do well to study is the different scale of proportion between the fleshy and bony parts. For this purpose he cannot do better than measure with great exactitude these parts and their relative positions. Here again, as in the hollows, the student often goes wrong. He generally makes the bony parts too big and too thick, especially across the ankles and the wrists, and shows little or no difference in the quality of surface as between bone and flesh. For this reason I advise students to make separate and specially careful studies, either in clay or drawings on paper, of the parts at (and immediately around) which the bone is exposed, noting the difference of surface and the number of small firm planes thereon. The fault of making the parts about the ankles and wrists too thick is often brought about by the armature being out of place.

With the exercise of care the lead piping can be easily moved a little to one side or the other, or back or forward, at any stage, without doing much damage to the part, although the more advanced a work or any part of it becomes, the greater will be the difficulty of making any change or rectifying any error.

Generally speaking, the chief reason for these parts becoming too thick is that the student goes on building up the clay without troubling to take measurements, or if taking any, doing so carelessly. He forgets, or does not know, that it requires but the fraction of an inch to make quite a big difference

Fig. XXX

SECOND STAGE SHOWING ALL THE GENERAL MASSES AND QUANTITIES PUT IN

It is now that the details should be introduced, the modelling and drawing carefully studied, and the whole brought together to refine it.

in the appearance of parts so narrow as the width of the ankles or wrists, even in a figure of life-size proportions.

There is nothing easier than to get such parts too thick, even if the greatest care has been taken over the measurements, for the reason that in modelling up such parts, putting on the smallest portion of clay imaginable means increasing the size. It is therefore advisable, as I have said before, to keep on the small or narrow side at these points until the finish, though in the early stages of building up the figure the student will do well to put these parts in very carefully, and all similarly exposed bony parts from the first equally clean and well-defined.

To shirk the head, hands, and feet is another error far too common with the student engaged upon modelling the human figure, and one which leads quite often to his losing interest in the work, and consequent despair. I have seen students model nearly the whole or greater part of a figure quite beautifully up to a stage approaching finish, whilst the extremities have remained just as they were put in perhaps months previously, and the student has gone on worrying all the good out of his work because he has not known what has been wrong when an advancement of these extremities was all that was required, these parts which have been shouting out for help and attention having been too long neglected.

It is especially advisable that the student, who cannot be expected to see in his mind the whole work complete from the beginning as an experienced artist can see it, should build up the whole work, so to speak, equally all over, and take care that each part develops together with the rest. The figure

should advance in proportion, just as all nature does from its infancy to maturity.

To put an extreme case, I may point out how absurd it would appear if in modelling a human figure you were completely to finish a head or limb before having begun to model the body under or above it, merely having an armature with perhaps a little clay roughed over it. It is equally wrong to carry, say, the torso to a high state of finish and to leave the other parts merely roughed in, or, in the case of the hands and feet, perhaps the armature still exposed and free from clay.

The student should endeavour so far as possible to keep every part advancing, and the whole gradually growing like the life model, in all its views and parts. It is only by the comparison of part with part that the student can expect to get one harmonious whole and the true balance of the human form.

The complete character of the model can only be obtained in this way; and the character of the model should be striven after very seriously, for a student who makes all his figures alike, one man or woman like unto the other, is not going to produce much of importance at any time of his career.

The difference in the character of one figure from another is as marked as the difference between the features of one person to another.

It will be found that every figure has more or less a particular character peculiar to itself, and every detail is stamped with the same character. For this reason the student should not—even if the practised artist should think proper to do so—work from more than the one model on the same work. If he does,

he cannot make a complete study; for I hold it impossible to use one model for one part and another for another part, and get one harmonious whole true in character throughout. You cannot successfully graft on in this way. Better far to copy faithfully each and every detail from one model, and though you may feel prompted to modify such parts as may be over-developed, undeveloped, or even deformed, such over-development or deformity is of nature's forming, and you will learn more by copying it than by trying to make some improvement without possessing a vast amount of knowledge of nature.

To a great extent the student's object should be to imitate what he sees before him, and in doing this well he will find difficulties enough to contend with. Moreover, he will be training the eye to see correctly. Then, when he has stored up an abundance of knowledge, he may discriminate and try to select the better from the good; but a student should not attempt to make any selection until he has made himself a master copyist and can model every little detail with great accuracy and facility, and at the same time get the true character of the model throughout. If he attempts to improve upon nature by leaving out or modifying before he has learnt how to copy thoroughly, he must surely produce a very tame and unprofitable work and fail to seize the true character of the model.

A student should endeavour to get the character. A figure may be well modelled and yet lack character, in which case it is cold and uninteresting.

Many fine works which exist to-day would long ago have been destroyed as poor examples of the art of sculpture, had it not been that they are masterpieces of character.

Character is as fine and important as any of the other qualities which are to be obtained in art.

In studying each model it will be found that all the parts are alike in character. There is a relationship; the legs and feet are similar to the arms and hands in line and planes.

Indeed, I say from head to toe all is alike in character, detail, as well as mass, some figures showing it to a greater and more marked degree than others, and for this reason will two figures but rarely be found even similar. When one does come across such an instance where one figure resembles another, it will invariably be found that they not only resemble one another in general form and detail but in disposition, manner, and, indeed, more strangely still, in voice, movement, and poise when walking, standing, or sitting.

CHAPTER VI

WASTE MOULDING AND CASTING

The term "waste moulding" implies that the mould is only made to serve the purpose of taking one cast, the mould itself being chipped away and destroyed in the process of getting out this cast.

Every one practising modelling, no matter how little, should have some knowledge of making a mould of his work, or of mould making and casting, for the moment will come, sooner or later, when he will require such knowledge.

To be skilful as a mould-maker means serving an apprenticeship to this craft, and much practice; although to learn enough to be able to convert a not too ambitious work from clay into plaster is not a great task.

The little knowledge required for this gives an insight into moulding and casting of models on a larger scale, though the student need only learn the principles of mould-making sufficiently to do a bust or small figure, to begin with.

Before a student attempts to make a mould of anything, however unimportant, he should first know well how to mix plaster of a proper and even consistency. With practice he will learn how to judge to a nicety the amount of water and plaster that will be required to cover a surface. For the mixing

Fig. XXXI

Moulding a Large Figure

Men arranging iron and wooden struts to support the mould.

he will therefore use a basin, or other vessel of such proportion as to hold well the amount, and thus avoid, wherever possible, mixing twice for a covering which should be done in one mixing.

Always keep your plaster in a very dry place, and see that your basins and water be perfectly clean; never mix your plaster too thick or strong, nor beat it up too long, or start to beat it up too soon. Wait until it has absorbed water and has become moistened. Let it sink to just below the surface of the water before starting to stir or "beat" it up. In putting plaster into the water, sift it carefully, though not too slowly, through your fingers; do not drop it in in a mass or body, or it will not "beat" up well, but will be lumpy and cause trouble afterwards.

You should next learn to know its "life" in its moist state, when the water has been added to it. Although this "life" may vary somewhat, the difference is only a matter of seconds. Yet it is important to know such difference when it comes to covering a work with plaster, or filling in a mould.

By "life" is understood the interval that passes between the actual mixing of the plaster and the time of its "going off" or "setting." For when it has once reached the "going off" state, the application is not only risky, but dangerous, as will be pointed out later on.

Let us suppose you wish to mould a very simple work in relief. Begin by mixing the plaster with clean water in a pail or basin, according to the amount you may require, but add first to the water a little colouring matter, yellow ochre, or, better still, the squeezing from a blue-bag, sufficient only to make it distinguishable from white. This is for making what is called the first coat or covering

of plaster. The reason for the adding of colouring matter will be seen presently.

Next, sift through your fingers carefully into the vessel of coloured water sufficient plaster to form a little mound standing just above the water in the centre of vessel.

When this has sunk down (which it should do in a few seconds), beat the mixture up with a large spoon, as one whips an egg, though not so quickly, and in such a way as to avoid making a froth.

Remove such scum as may rise to the top, and then splash or throw the plaster lightly with the hand in sufficient quantity over your model to form a coating of about a quarter of an inch in thickness, so that the form of your work can still be traced.

Only two or three minutes elapse between the moment of beginning to sift the plaster into the water and the time of its application on to the model. It will therefore be seen that one's attention is wholly occupied for the time being.

Do not attempt to smooth the top surface of the coat of plaster. It should be left irregular and rough; and it is as well even to drop little blobs of plaster on it to get an uneven surface, if too smooth, which will form, as it were, keys to hold this coat to the next and thicker one, which is to be made over it.

When the first coat has become sufficiently hard—which may be a matter of ten to fifteen minutes—smear it over with a little clay water. To prepare this, mix a small quantity of clay with water, until it is dissolved and presents a liquid of a little thicker consistency than muddy water. This is to prevent the thicker or outside coat sticking to the thin or first covering of plaster.

Now mix a sufficient quantity of plaster with clean, uncoloured water to form the second coat, which should be about four or five times the thickness of the first. Apply this second coat equally over, and following the form of, your work. At this stage of the work, while the plaster is still in its liquid or soft state, thin strips of bent iron may be put across it and slightly embedded. These will help to strengthen your mould and at the same time serve to prevent its warping. When this last coating of plaster has become properly "set," which will happen in some ten or fifteen minutes, you may begin to remove the clay from the mould.

All these remarks refer to the making of a mould of a relief, and not of a work in the round—something that may have been built or worked upon a board covered with a slab of clay as a background. To separate the mould from the clay, you should first place the whole thing on a table, then wet the back of the mould a little so that the moisture, when it gets soaked through to the clay surface, will soften the clay; then with the end of a broad chisel inserted in several places between the mould and the board upon which your model is made, you will easily prise the mould off the clay. It will facilitate matters if, when prising it, you pour a little water between the opening, *i.e.* between the board and the plaster where your chisel enters. When you have taken your mould off the body of the clay, it will probably be found that some few pieces of the clay have come away with the mould and remain inside it. Remove these by taking out small amounts at a time with a wire or scoop tool, unless the pieces left in are so small as to be easily taken out with a small wood or steel tool. Never attempt to pull out the whole or

great pieces bodily, or you will break off pieces of your mould, and perhaps the whole mould itself will be broken. This is likely to occur more especially if the clay be hard or stiff. The removing of the clay must not be hurried. A fault far too common with the beginner is that of being in too great a hurry at this stage (as in the chipping-out stage). It is well to remember that it is the purpose to get the clay from the mould, and not the mould from the clay. The greatest care is needed to remove the clay from the "undercuts." We will now suppose that all the clay has been taken from the mould. The next process is to clean the mould thoroughly, by washing it with water, by means of a syringe, soft brush, or sponge, taking care not to use such force as will destroy the surface of your mould, which, it will be remembered, is far from hard or strong. For this reason the syringe is distinctly the best thing to use —an ordinary garden one with as fine a "rose" on it as it is possible to get, for the finest spray that you can blow on to your work is enough and the best. If the syringe be used, do not put it too close to your mould or the force may injure the surface.

When your mould appears quite clean and free from clay, let it stand for a few minutes in order that the water lying on it and in the crevices may drain away. It will then be ready for "soaping," which is a method of applying a mixture of soft-soap and a little oil in the proportion of two tablespoonfuls of soap and one teaspoonful of sweet oil to one pint of water. Put the mixture into a saucepan and boil it. This mixture, if bottled, will keep some time.

It is better to allow the newly made mixture to cool a little before using it. It should then be applied freely to the mould with a soft brush for a quarter

of an hour. Remove from time to time the soap which may have lost its nutriment, adding a little more of the fresh soap, and continue brushing. If now the mould presents a somewhat shiny or glossy surface, sponge or get out with a soft brush the remainder of the soap and throw it away; for having been once used, it is of no further value.

Be particular that every particle of soap is removed from crevices in the mould; otherwise it will "kill; the surface of the plaster which is afterwards poured in to form the cast.

Another and final mixing of plaster is now necessary. This must be free from colouring matter, and is poured gently into the mould to the thickness of the cast desired, the mould being shaken slightly to expel any air that may have prevented the plaster running up into the smaller parts. This should be done at the moment of pouring in a little of the plaster, just enough to cover the surface when this thin coating is covering the mould. Another good method is to blow it up into the crevices. But in no case should the plaster now in the mould be allowed to show signs of setting, or the other, which is to be poured in from the same mixing to fill the mould, will when poured in remove or wash up this first coating from the surface in parts; whilst if it be poured in soon enough, it will mix properly with the plaster already in the mould, both being of an equal consistency. Wait now for at least fifteen or twenty minutes, when the plaster will have become hard, then turn the whole over, *i.e.* the cast downwards, and on to a little softening, a folded sack or other material, which serves to resist somewhat the jarring caused by the continual hammering in the course of chipping away; and begin by removing

such irons as you may have found needful to put into the mould. Then chip away the white coat with a wooden mallet and a blunt chisel. Chip this away bit by bit fairly equally all over, continuing until you get through to the coloured or first applied coat of the mould, the exposure of which is a warning that the surface of your plaster cast is near. This will explain the reason for the use of coloured matter.

The greatest care and skill must be exercised in chipping away without cutting into the surface of the plaster model, for it will be found the last or coloured coating, the surface of which was made somewhat greasy and non-porous by the soaping of the mould, will come away in pieces quite easily from the cast.

WASTE MOULDING IN THE ROUND

In dealing with a work in the round, the moulding process becomes more difficult and complicated, especially in the case of a full-length figure or group of large proportions, which requires a professional moulder.

But, to say the least, a student should be capable of moulding a half-life-size figure or a life-size bust, and I now purpose to deal with this subject.

Up to a certain stage the principles are the same as those previously described in moulding the simpler work on the flat, but the difficulty is increased by the fact that the bust, figure, or work in the round, has to be moulded in a number of parts or pieces, and judgment is required to know how best to divide up these parts.

In a bust only two or three such pieces may be

necessary, and so the work is somewhat lessened, at least, as compared with that in the moulding of a figure.

The student, in making the mould of a bust, should first start by determining where a joint will best be made, so as to do as little disfigurement to the features of his work as possible; and he will do well to follow the course usually adopted of having this joint up the side round the back of the ear, directly over the top of the head, and down to the base in a line corresponding with that on the other side.

He should now prepare small strips or bands of clay, smoothly flattened out, and cut in lengths of eight or twelve inches, barely a quarter of an inch thick, resembling narrow laths of cleanly planed wood.

These bands are put where the joint of the mould is to be made, *i.e.* up the sides of the base, over the shoulders and head, following the line already decided upon, to act as walls to form the joint, and also to prevent the plaster going beyond them. See Fig. 32.

These bands, before being put round the clay model, should be cut very cleanly on their edges which come next to the work, so that they fit closely to it, leaving no apertures between them and the modelled surface work, through which the first coat of plaster might find its way.

It is usual to mould the front first, and therefore the wall or band should be fixed, or supported, by little struts of clay from the back, to prevent the bands being washed down or moved when the plaster is put on the front.

The back of the bust should be covered with wetted tissue-paper, to prevent the work getting splashed with the plaster about to be used to cover the front.

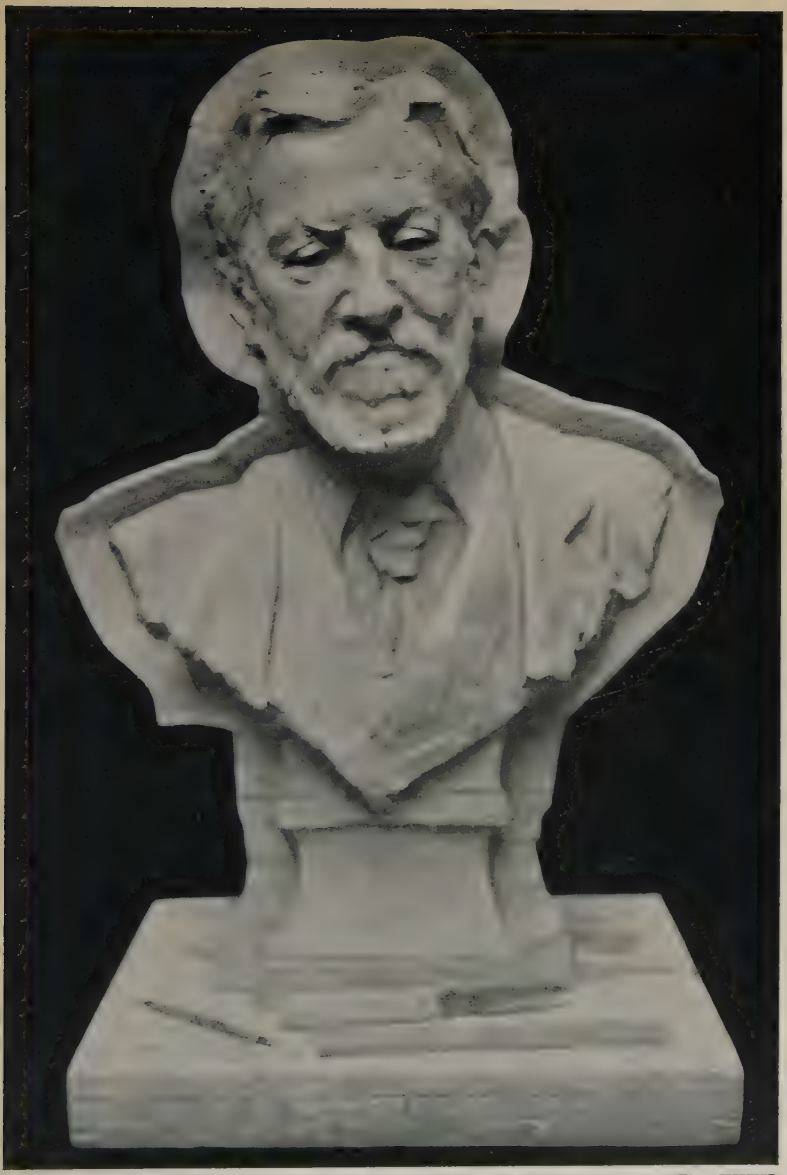


Fig. XXXII

BUST WITH THE WALLS OF CLAY PLACED ROUND IT

It is now ready to have the first or coloured coat put on.

This first coat of plaster has to be mixed with colouring matter, and applied in the same way as in the smaller work, except that it has to be done more speedily, and *flicked* on more cleverly with the fingers all over the front, with as little delay as possible, special care being taken to let it find its way into every minute hollow or crevice; otherwise holes will be found in the mould where the plaster has not "run up" to the surface of the clay, and your cast, in these particular parts, will not represent the form you had in the clay model.

This first and coloured coat (Fig. 33) having become sufficiently hard, brush over the surface a little clay water, and then cut some pieces of iron, long enough to reach from the top to the bottom of the bust, and bent so as to follow the corresponding general shape of the work on the front.

These rods of iron should be about half an inch in thickness for a mould of such proportions as we are now making, and are used to strengthen the mould, by being bedded into the outer or second coating of plaster, just at the time when this coating is beginning to set.

Strips of this iron may also be put horizontally across the mould to give extra strength, and to prevent the mould from warping, as it may do without this additional strength.

The front being made, remove the "cottle" or clay wall, and clean the edges and sides of any roughness of the plaster formed by this wall. Then cut some V-shaped and round keyholes into both sides and top, a few inches up from the base, and others about every four or five inches or so apart, making in all about ten or twelve. (See Fig. 34.)

Now clay-wash or soap these edges well, carefully

Fig. XXXIII

BUST WITH ITS FIRST OR COLOURED COAT PUT ON

It will be seen that the surface is left rough, and in places undercut, to form keys to hold this and the next coating of plaster together.

avoiding to touch the clay model with soap, and then proceed to cover the back with plaster, in exactly the same way as you did the front, not forgetting to put in the iron rods when applying the second coat.

When the last coat of plaster has sufficiently hardened, clean down your joint, removing with a knife any plaster which may have overlapped these joints when the last coat was applied. Next take a syringe, sponge, or brush full of water, and wet both the back and front of the mould until the moisture has penetrated to the clay, and at the same time apply a little water down the joints and on the top.

It is now possible to see the joints separating to the smallest degree, and you may start upon opening the mould by inserting into these joints, between the keys, a broad chisel, tapping it slightly with a hammer or a wooden mallet, repeating this in several places round the joints. Even a little suggestion of prising may be indulged in, but a little only, and equally at each place where the chisel has been inserted, otherwise the keys will be broken, and more than probably the mould as well. With care and patience the mould will give evidence of parting, at which moment more water should be squeezed in at the top. This softens the clay, swells it, and helps to separate the two mould pieces from each other, and also the clay from the plaster.

The back part is now, we will suppose, removed from the model; for it must be the back part that comes off first to allow the removal of the clay from the front part of the mould, which is done by scooping it out, until the front of the mould stands in its place nearly emptied of its clay, and only the upright peg, on which the model was built, remains inside, the other parts of the armature having been pulled

Fig. XXXIV

BACK VIEW OF THE BUST, SHOWING THE FRONT MOULD PIECES COMPLETE

The clay walls removed and the V-shaped notches cut in the sides of the plaster.

out or cut away whilst the clay was being removed. You will now be able to take the front mould and place it on the floor upon its back; and the remaining clay can be removed with little difficulty from the holes or crevices.

The process of washing and afterwards well soaping being completed, the mould is put together, locking itself, so to speak, by the keys which fit into the keyholes. The mould is now tied together with strong rope, and across the joints strips of tow dipped in plaster should be placed at intervals to prevent the expansion or opening at the joints by the swelling of the plaster when it is poured in to make the cast. For it should be known that plaster generally swells when mixed with water, just a fraction, but quite sufficient to make a perceptible difference in the mould, unless the two halves have been well tied together in order to prevent it opening. Furthermore, tying the mould closely up prevents the plaster running out at the joints.

In "filling in," as it is called, when you are making your cast, only sufficient plaster should be mixed to form a coating all over of about a quarter or half an inch, this being poured in whilst the mould is raised from the ground on to a box or low table, and is standing, as it were, on its head. The plaster is poured into the mould, which is turned round and round rather quickly and whilst the mould is gradually got into a horizontal position, so that the liquid plaster may force its way into all hollows and undercuttings. This should be done to prevent, so far as possible, an unequal distribution of the plaster, and should be continued for a few moments, gradually getting the mould beyond the horizontal, until the moist plaster has run down and covered the base or

Fig. XXXV

The Mould Completed

The back part removed and the clay partly taken out, exposing the armature.

plinth of the bust. Then tilt the mould still more, allowing to run out into a basin below the plaster which is left over after the inside surface of the mould has been fairly covered. This overflow can be poured back again into the mould, the operation being repeated several times, but not after the plaster has become too stiff and is past the liquid state.

Carefully avoid the plaster settling in any particular place in the mould, and becoming thicker than elsewhere; this being one of the reasons for turning the mould.

You will require to mix more plaster, and repeat the pouring in and out process until your cast is about three-quarters of an inch in thickness all over. In no case make your cast solid or heavy, for a bust cast solidly not only takes long to dry and is cumbersome to move, but it is not so strong as when cast hollow.

To strengthen the neck and other thin parts—indeed in all parts where possible—pads of tow or canvas, dipped into the basin of liquid plaster, may be put inside the mould; but these pads or pieces of canvas should only be put in when making the second or third "filling," as otherwise they will come to the front surface of your cast and be visible.

Your cast is ready now to allow of the chipping away of the mould; almost the first thing to be removed, after the mould is untied, being the irons, parts of which may be, and usually are, exposed by reason of their not being embedded too deeply everywhere. They are easily removed by chipping or clearing the plaster from around the edges with the mallet and chisel; but there is no reason for

removing them all at once, as they may be left until such time as is deemed best and easiest.

To get the outer surface of your mould away is really the first thing; remove it in a uniform way, bit by bit all over, until only the coloured plaster remains and is all exposed. This latter should come away quite easily if the mould was properly soaped, and care is exercised (Fig. 36).

There will, it is almost certain, be some little chips or scratches from the chisel on the bust, but these can be filled in afterwards with a little "killed" plaster. If not "killed," the plaster will, when applied to the little holes or scratches, be harder, when quite dry, than the body of the cast, and slightly darker in colour.

This increased hardness makes it difficult to work upon these mended or filled parts. The tool will meet with resistance when passed over such parts, and will more likely cut into the plaster cast immediately round the filled-in part.

To "kill" or to reduce some of the virtue of the lime contained in the plaster, take a saucer, or other vessel, with a little water in it, and sift into this a small quantity of plaster, leaving it for a few minutes, without beating or stirring it up. The plaster will sink to the bottom. If, on cutting a line through it with a knife or tool, you find that the line does not close quickly, it is "killed." Then stir the plaster up in the usual way, and it is ready for use. It should, however, be borne in mind that the plaster has "gone off," gone past use, if, when cut through, it appears at all hard, and incapable of closing again where severed.

Another method of killing plaster is to take a small quantity in a spoon and place it under water

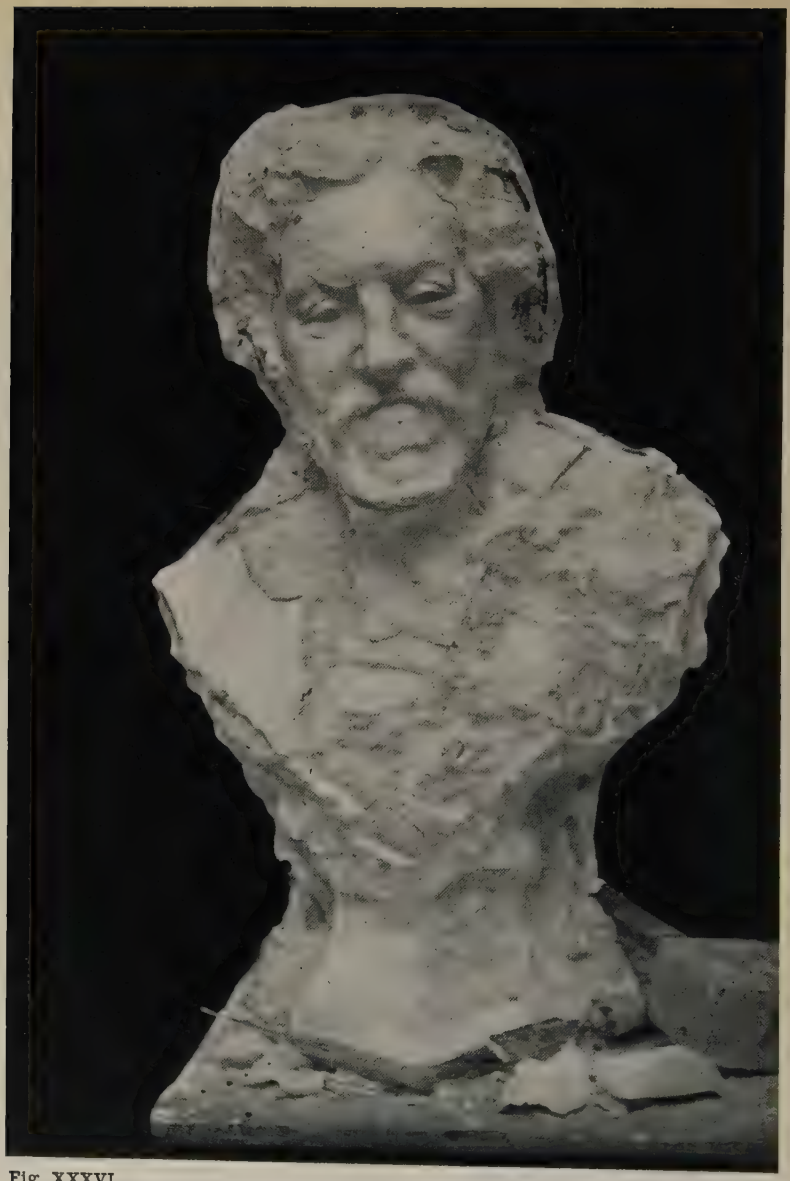


Fig. XXXVI

A Portion of the Mould chipped away, exposing the Plaster Cast

It will be noticed that only parts of the coloured coating of the plaster mould remain to be removed.

for two or three minutes; then take it out, and mix or stir up. Killed plaster is only used for filling up chips, and not for fixing on broken pieces. For this purpose plaster should be mixed in the ordinary way, and not "*killed*."

Supposing, for instance, a piece were broken off the nose, ear, or finger, and you have this broken piece. Hollow it out at the joint, so as to form a cavity rough and scratched at the bottom and on the sides, taking particular care not to destroy the edges of the joint. Proceed in the same way with the part from which the piece has been broken. Then soak well with water both cavities, until such time as these cavities are slow to absorb more. Then mix your plaster and pour into each cavity just a little more than it will hold. Now quickly fit and press together the two parts, so as to squeeze out all extra plaster until the joints fit up quite closely, taking great care not to move in the slightest the piece you have fixed on, until such time as it has become sufficiently well "set" to hold together. A few minutes should suffice, although from ten to fifteen minutes more will have to elapse before you can safely work upon the joint. In the meantime other parts of the plaster model may be worked on, making it presentable.

A good deal may be done in this way with steel tools, riffles, gauges, and flat cutting being the most useful; and, sparingly, a little fine No. 0 or No. 1 sandpaper may be used. Good effect can also be obtained on the hair and drapery with a hog's-hair brush, and a little nearly "killed" plaster.

Not only can difficult textures be obtained by this means, but partly freed bits may be put on, or added, to the hair, which could not have been

modelled in the clay owing to the danger of breaking off in the process of waste moulding and casting.

But in no case can plaster be applied to your model if the model be in any way dry. Being of a very porous nature, a plaster cast absorbs all the moisture from the killed plaster the instant it is put on, and leaves the killed plaster merely useless dust that crumbles away when touched. Therefore due care must be taken thoroughly to wet those parts of the plaster model to which it is intended to make additions.

If the student should become ambitious and desire to mould a full-length life-size figure or a statuette, he should follow the same instructions, except that he will require to make more pieces, and use greater judgment in doing so.

A dozen pieces may be required, varying in shape and size, but one and all are made on the same principle, viz. to come away and to be put back again into their respective places, and their keys to fit into the keyholes.

It is necessary to make the mould in many pieces, because without this expedient it would be impossible to get the clay out of the mould in many places, such as in the case of an arm extended and freed from the body, as shown in Fig. 37, or in some piece of drapery, standing somewhat away from the figure, being bigger at its extended or extreme end than it is between this end and the place of its attachment to the figure. Moreover, you could not be sure of the plaster running up through a small cavity and into a larger cell; and furthermore, parts such as these have to be strengthened by small pieces of iron or wire, and these irons or wires could not be inserted in their twisted or bent

Fig. XXXVII

A Figure in the Round, with the Clay Bands or Walls put on

It has been thought necessary to support the outstretched arm with a piece of wood, to prevent its dropping when the plaster is put over it.

Fig. XXXVIII

THE FRONT PORTION OF THE MOULD COMPLETE

Fig. XXXIX

Mould of Back of Figure

Made in two halves to enable you to remove the iron support. Over portions of the arms up to where the clay walls are placed separate mould pieces are made.

Fig. XL

THE THREE MOULD PIECES

(*i.e.* the top of back piece and two arm pieces) removed and a portion of the clay taken out, exposing the armature.

shape unless the mould were made in sections to make such insertion possible.

These pieces of iron or wire are made of such a length as to reach from near the end right up to and through the attachment into the body, and are of such a thickness—or perhaps I should say thinness—as to be well within and hidden below the surface of the finished cast. They should be bent or twisted to the shape of the parts in which they are to be placed. To ascertain the shape, these supports may be tried in the mould. When made to fit, they should be thoroughly japanned, or coated with some substance to prevent their rusting and discolouring your cast.

Into fingers and other clearly separated parts, little wires are generally put to prevent them from breaking off.

When your mould and all its pieces are prepared, take these irons or wires, as the case may be, and fix them into their respective positions in the moulds, with a little plaster dropped in small blobs here and there to support them in their position. Be careful not to let them fall or force themselves with their weight on to the surface of the mould (Fig. 41).

This you can avoid if you will allow the little blobs of plaster to get but a suggestion of firmness about them, sufficient to serve to support the weight of the wires, and yet moist enough to bind round and hold them in their places.

In a few minutes you may mix your plaster and fill in this part and the part which is to fit on to it, simultaneously, and when the filling is just firm, or "set" enough to prevent it from running out from the cover or top mould, which needs be turned over, the top or cover piece should be quickly put into its

Fig. XLI

FRONT MOULD PIECE WITH IRONS FIXED IN

place, squeezed or pressed to force out superfluous plaster, then held down and tied (Fig. 42) so as to prevent swelling or opening. When you have done such other parts as may require a similar filling, then tie up the whole body of your mould, and run plaster in as you do in the case of a bust, from the bottom, although it may be necessary to put irons in the legs and through the body, if these parts are narrow or thin, as would be the case with a standing nude figure, where, as will be easily understood, the irons should be put in before the mould is tied up.

Where the ankles alone are to serve as support for a bigger and heavier body, infinite care should be taken to place the irons correctly, so that they may pass down from the body nicely through the middle of these thin ankle parts, and again down into the base, and here turn at right angles to form a foot which will strengthen the support considerably. These irons should be bent to the shape of the legs, and fixed with little blobs of plaster in the same way as was done in the arms, in the front portion of the mould.

Great care should be taken when filling in a mould which has very narrow parts in it, such as shown in Fig. 37 at the ankles, to avoid such parts getting closed up before you have a sufficient thickness of plaster in the body and other parts. The aperture at the ankle is so very small, more especially with the iron in it, that it requires but a little plaster to close it up entirely, and thus prevent more plaster being poured in and out. Though the arms and the legs will be solid in most parts, the body and the head should be kept hollow, so far as possible, and will be stronger for this very reason, as it will easily be understood that the body, if solid, would be a

Fig. XLII

THE MOULD WITH THE ARM PIECES "FILLED IN" AND TIED UP

large mass, and therefore a heavy weight to be supported upon thin ankles; and there would be great danger of breakage at these points during the progress of chipping away the mould. In many instances, parts such as the face or head are "filled in" before the mould is finally put together.

In chipping away the mould from a figure which has parts as narrow or thin as the figure here illustrated, it is necessary to let the mould remain untouched at such thin parts, until the plaster has been taken away from the upper and bulkier parts of the body. The reason, it will easily be understood, is to lessen the great strain that has to be borne by such narrow parts. Hence the advisability of making not only a light cast, but also particularly a light mould.

Remove the whole of the outer casting of the mould from the upper part of the figure, before you attempt to touch round thin ankles, and never be in a hurry or you may not expect to get the mould away without some damage to the cast. If you attempt to knock off by lumps you will give yourself a lot of unnecessary trouble and produce an unsatisfactory casting. Great care is needed in moulding and casting as in all other things worth doing. Slow and sure is the principle.

THE PROCESS OF WASTE MOULDING WITH WAX

For small and very much undercut relief work, wax is an excellent material for moulding. It saves the chipping away of one (the coloured) coat, which invariably brings about many chips into the surface of your cast, unless great care is exercised. Wax is not as commonly used as plaster, and will not do for all things as plaster will; yet it is well to know

something of it, and therefore I propose to point out the way how to mould, say, a panel which you may have modelled in high relief.

Place this panel upon a flat bench, and build around it walls of clay to a height rather above the highest projection in the model. Put into a saucepan sufficient moulding wax (beeswax and rosin) to cover entirely the surface of the panel. Melt this wax down slowly over a ring gas burner, and then pour it gently over your modelled panel and leave it to cool, a matter perhaps of a minute or two. Then make a hole in one corner through the clay wall, and pour off all the wax except just a sufficient quantity to leave a thick skin on the work, following its form equally all over.

Should the surface of the wax now appear smooth, then pour a little more wax on parts with a spoon, and scratch it here and there with a piece of rough wood. This will serve to form a kind of key which will hold the wax to the plaster coating that has next to be put on. But before putting on this plaster coat, it is advisable to paint or smear slightly over the wax with a little clay water, to prevent the plaster adhering too tightly to the wax when the process of chipping away begins.

Having stopped the little hole in the corner of the wall, next pour your plaster coat over the wax and then embed a few pieces of iron (bands) in different directions to strengthen the mould. When your plaster mould has got quite "set," turn the whole over and remove the clay. This done, wash the surface of your wax mould until you have removed every particle of clay. Then dry the mould a little and pass the smallest quantity of oil over the wax surface.

Mix your plaster in the ordinary way, and pour it in quietly, taking care that it runs up into the hollows. Then use a little tow or canvas dipped in plaster, and place it lightly into the cast. This will add strength and enable you to keep it light.

When the plaster is thoroughly set, turn the whole over again on some soft material, sacking, or any similar substance. Then, with great care, you may set to work to chip off the plaster part of the mould with a hammer and blunt chisel. When this plaster has been removed, the wax will remain. To remove it, pour a little hot water over it and slowly pull it from the cast. Use hot water until every particle of wax is removed, but do not make the wax too soft or it will melt and become quite sticky.

Any stains can be got away by the application of hot water with a soft brush or sponge.

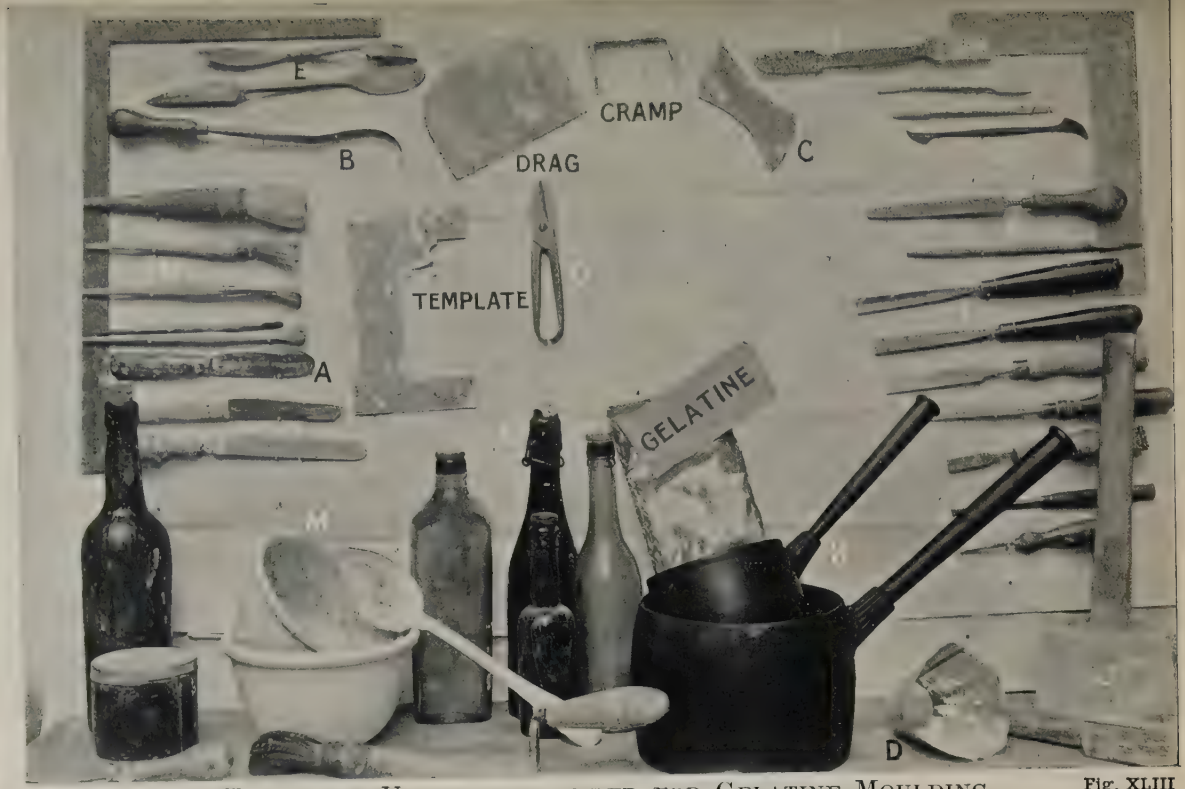
CHAPTER VII

THE PROCESS OF GELATINE MOULDING AND CASTING

The moulding and casting in gelatine of a bust or statuette of a simple arrangement, as illustrated, is possibly the simplest and easiest example in the round, as there are only required two or three pieces —*i.e.* the front, the back, and the base. This offers few, if any, complexities in the moulding and casting, as these processes, described at some length in a previous chapter, should already have afforded the technical knowledge necessary for the work.

In the first place, the statuette should be covered with a coating of clay, of the same thickness as will afterwards be required for the gelatine (Figs. 44 and 45). This thickness, of course, will vary according to the size of the object to be moulded; in a life-size bust a thickness of about half an inch to three-quarters of an inch will be sufficient.

The clay should be spread over the model, being kept thicker where the divisions will be made, usually about half-way—*i.e.* up the side, round the ears, over the temple and head, and down on the other side to the base. The clay should then be carefully smoothed and oiled, and the front half covered with plaster, pieces or strips of iron being inserted in different directions, before the plaster sets, to strengthen the "case," as this covering is called.



TOOLS AND UTENSILS REQUIRED FOR GELATINE MOULDING

Fig. XLIII

A, keyhole tool; B, clay remover; C, drags; D, funnel; E, spatula; F, perforated plaster riffler; G, plaster tool; H, files; I, plaster chisels and gouges; J, chipping-out mallets; K, gelatine saucepans; L, bottles for oil, shellac, soap, &c.; M, basins; N, brushes; O, shears for cutting metal.

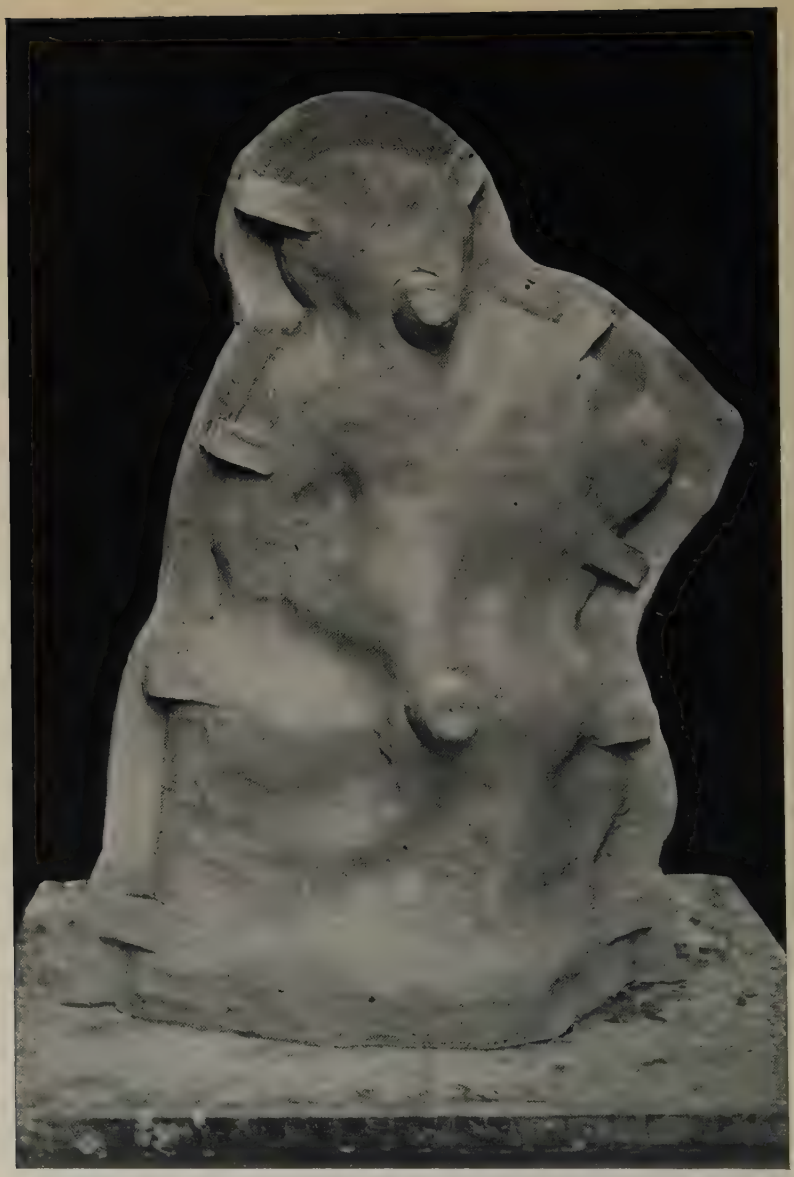


Fig. XLIV

THE BACK OF THE MODEL WITH A THICKNESS OF CLAY PUT OVER IT

Fig. XLV

THE MODEL AS SEEN FROM THE FRONT

When the plaster is set, the rim or edge, where it will join the back half, should be cut smooth, and round holes or keys made in this rim at intervals of three or four inches apart. To stop the plaster of the back half from adhering to the front half where the rims come together—*i.e.* at the joints—soft-soap thoroughly these edges, and afterwards brush on a little sweet oil.

You may then begin to make the back half of the "case," which should be done by covering the whole with plaster; it is treated exactly the same as the front half. Take special care that the plaster entirely covers the rim and fills the keyholes where the cleavage of the front and back comes together. The case should then be tied up securely, to prevent its opening, and then turned upside down. The edge of the mould around the base must then be scraped or cut smooth, and the keyholes made in the mould and in the bottom of the pedestal. If the pedestal is hollow, it must be filled in with clay to prevent the plaster running inside the bust; these parts should then be soaped and oiled and then covered with plaster to make the bottom piece, which piece will serve to hold the two halves together, and keep the model in its place when inside the case and when the clay shall have been taken out, leaving a space to be filled afterwards with gelatine.

When this bottom piece of plaster is "set" it should be removed and then the front half taken off. The clay can now easily be pulled away from the front half of the work, which is for the time lying on its back.

The front case must now be prepared for running the gelatine on the front half of the bust or model.

A large hole should be made in the case where the

Fig. XLVI

CASE SHOWING HOLES MADE IN IT THROUGH WHICH THE GELATINE IS POURED

Fig. XLVII

FRONT CASE REMOVED AND THE MODEL PREPARED FOR RUNNING THE GELATINE ON THE FRONT HALF

highest or most projecting point occurs, probably over the nose or forehead, for through this hole the gelatine will be poured. It is advisable to make other small holes in places for the purpose of ventilation when pouring, and these should be stopped with clay as the gelatine forces its way up, or the mould will not fill and gelatine will run away. These ventilation holes being on a lower level than the inlet hole, V-shaped keyholes must be cut in several places around the edge or rim of the case, bevelled, so that the mould will draw easily away in one direction. These are to keep the gelatine in its place when it gets firm.

When these keys and holes have been made, and the inside of the case has been scraped fairly smooth, two or three coats of brown polish should be applied to this inside surface and to the edges. The case may now be set aside for a time, and the model painted with one or two coats of either white or brown polish, if this has not previously been done. The clay, which shows around the case, should then be smoothed off level with the back half, where the gelatine will meet it and form the joint.

In this smooth clay surface holes should be made with a round-nose modelling tool. The gelatine will flow into these, forming keys in the joint. This will keep the joint of the gelatine level, and also prevent it overlapping, or not meeting properly when it is put together for casting.

When all this has been done the entire surface of the prepared case and front of the model should be oiled with a stiff brush; this will stop the gelatine from sticking to the model or the case.

The case may next be placed over the model, and it will be seen that the keys will fit into the back

half, leaving the face of the model the right distance from the case. The bottom piece should also be adjusted, and the whole tied up securely.

The gelatine, in the meantime, should have been very slightly soaked in cold water, and then put into a saucepan or pail, which should be placed in a boiler of hot water until the gelatine is melted down, care being taken not to make it too thin or too thick, for else it will either not be sufficiently elastic or too much so. From fifteen to twenty-five pounds would be required for a life-size bust.

The gelatine having been properly melted, it should be taken from the boiler to cool, as it must not be poured into the mould when too hot. A tin funnel, or one made of clay, should then be placed over the large hole, and pieces of clay should be to hand to plug the ventilation holes in the case, as the gelatine rises. It is now time to pour the gelatine slowly through the funnel into the large hole in the top, carefully watching as it rises to the ventilation holes in different parts of the case, as it comes up to the level of the funnel, to make sure that the gelatine is not escaping anywhere round the joint. When it ceases to sink as you pour, you will know the mould is filled.

It should be now left to get cold and firm, when it may be turned over, and the back half of the case, which is now uppermost, should be removed and prepared in precisely the same way as the front half, viz. the pouring hole, vent holes, and keys made as before directed; the surface scraped evenly smooth and polish applied, and oiled.

You will see the gelatine showing in the front half where the division or joint is made, and this must be painted over with a strong solution of alum,

and then oiled; the portion of the model to be moulded should also be oiled.

The back case should then be placed in position and the gelatine poured in, as in the first instance, except that it should be very much cooler, or it will melt the gelatine at the joint as it runs over it.

When this last pouring of gelatine has cooled sufficiently the cases should be removed, and the gelatine moulds taken off the model and put back in the cases which they fit. The mould must stand for a time before you attempt to make a cast, except, perhaps, in very cold weather, when the gelatine is firmer and is also less affected by the heat in the plaster.

The next process to be entered upon is the making of a cast from the mould.

The surface of the gelatine mould should be brushed over with a preparation of strong alum water, and afterwards a little French chalk brushed over it. The alum will not only cleanse the surface of the mould, but at the same time harden it and rid it of too much oil, which may have been left in. Then brush off the chalk, and lightly brush over the mould with a very little sweet, or any fairly thin, oil.

The mould should now be put together and tied up with strong cord, or better still rope, and it will then be ready for pouring in the plaster.

Next mix a handful of ground alum in a large pail of water, and from this pail take, in the quantities as required, water with which to mix the plaster for casting the two first coats. A basin of plaster should thus be mixed, and sufficient of it poured into the mould to run all over the surface.

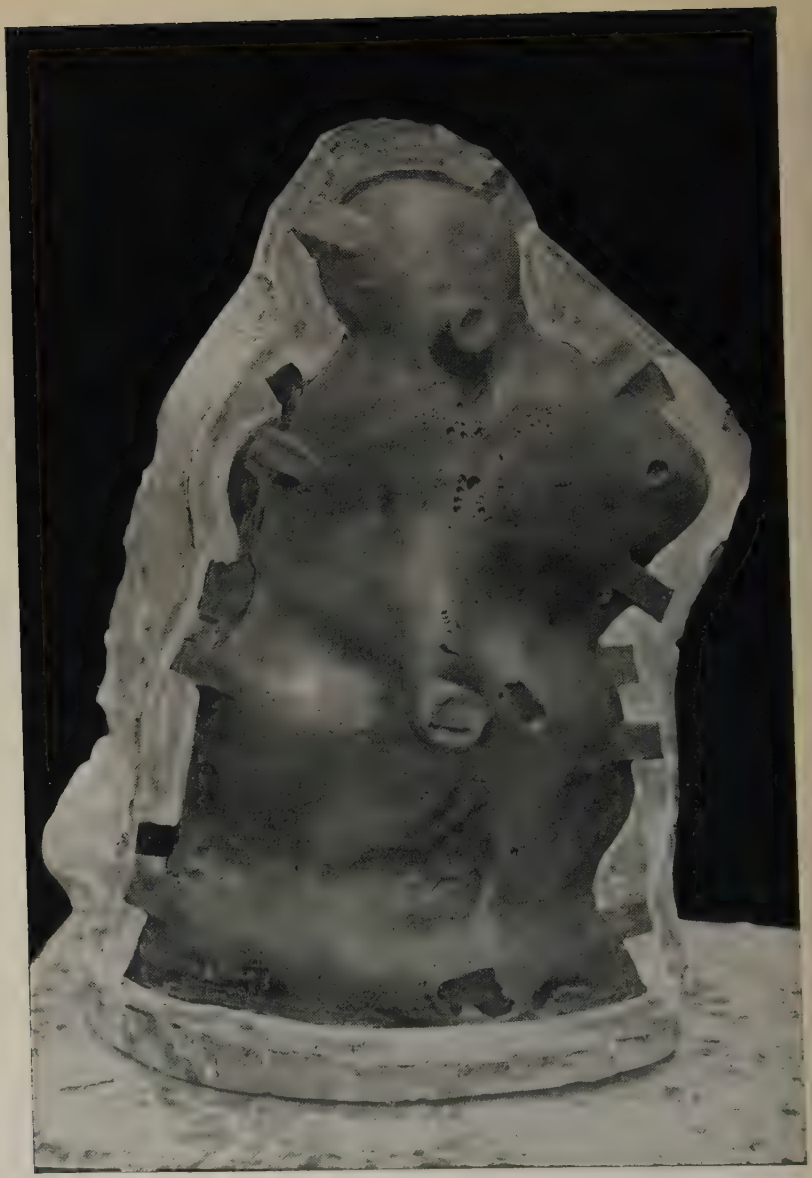


Fig. XLVIII

SHOWING THE GELATINE ON THE BACK HALF AFTER THE CASE HAS BEEN REMOVED

Fig. XLIX

COMPLETE GELATINE MOULD LYING IN THE CASES AFTER THE REMOVAL OF THE MODEL

The mould should be turned and well shaken, whilst the plaster should be poured in and out of the mould two or three times. This will ensure its finding its way into the hollows and all other parts, and will also prevent the forming of air-holes.

While the plaster is setting, another coat of somewhat thinner consistency should be mixed and poured in.

Some pads of tow which have been previously prepared should be saturated in this last mixing of plaster and spread evenly over the inside, which can be reached by the hands. As I have before mentioned, this will strengthen the cast and also enable you to make it lighter in weight. More plaster should then be run into the mould until a sufficient thickness is obtained. It is not advisable to make your cast thick and heavy. When the plaster is set and begins to feel warm, the case and gelatine mould should be at once removed, as otherwise the warmth will melt the gelatine and make it useless for further castings.

To remove the gelatine mould from the cast (when you have taken off the case), the whole should be placed upright and the fingers worked round the seam of the gelatine, where the two parts meet, gradually pulling or stretching it, so to speak, away from the cast. As the gelatine mould-pieces are removed, place them back into the cases ready for preparation (as before) for a second casting.

CHAPTER VIII

MODELLING FOR TERRA-COTTA

Modelling for terra-cotta has been little practised of recent years by the sculptor. It is difficult to give a reason for this neglect of a method which affords the best and easiest means of preserving one's work in a permanent and agreeable material.

In transforming one's work into a permanent state by any other method it must, almost of necessity, pass through other hands, as in the case of bronze or other metal, or stone. The result is in the end only a copy, or reproduction, of the original model in another material from that in which it was created; whereas in the case of terra-cotta it may be actually the original which is sent to the kiln, fired, and returned to you, without having been touched by any one, for you may place it in the kiln, and also remove it therefrom yourself when finished, as I have so often done.

Besides this, the method of getting one's work into terra-cotta is so simple that any student, with care and a little knowledge, can himself prepare his model for the firing process.

Moreover, the modeller may have his work in a colour to his own liking, almost from black to white, although the more common clays are usually of a buff or reddish tint. These latter are more easily

obtainable, though other shades are quite within reach at a moderate cost.

The early Italians produced many works in terra-cotta, practising the art to a very great extent, and most beautiful are the examples to be seen in the museums, both here and abroad.

In some instances they applied wax over the surface, after the work had been fired, to take away the somewhat dry appearance peculiar to burnt clay; and almost invariably they tinted or painted the terra-cotta, sometimes introducing here and there a little gilding.

In the case of Della Robbia sculpture or modelled ware, the clay was in most instances glazed; but I do not propose touching upon this process, as it is one which does not come within the scope of this manual. The working of it is a very serious undertaking, and is really an important part of the potter's art.

When a student intends his work to be fired he must take particular care that his clay be kept perfectly clean and free from any suggestion of plaster; for plaster, however small the amount may be, acts disastrously upon burnt clay, and if the minutest quantity is left in the model it will, after the work is fired (maybe after some days or perhaps months), force its way out by bursting a piece from the surface, possessing as it does surprising strength. When this trouble has arisen, it may on examination be discovered that the tiniest bit of plaster imaginable is to be seen at the bottom of the cavity whence the piece has been blown, and this alone has caused the damage.

In building up a work for terra-cotta, the armature should be kept as simple as possible, so that it

may be removed easily when the work is finished and ready to be put aside to dry. Let it be remembered that all moisture should be dried out thoroughly, though very slowly, before the idea can be entertained of sending the work to the kiln.

Of course, in some cases, your model may be so small as not to require any armature, but even then it should (when possible) be hollowed out most carefully to a fairly even thickness; otherwise in the drying and firing processes it may crack and "fly." But in the case of a larger work, when an armature is employed (as, for instance, in a bust), this armature should be removed by first slicing off, with the thinnest wire obtainable, a piece from the back of the head, in the manner as shown in Fig. 50.

When this piece has been removed, and carefully placed aside, cut a second piece down towards the base, using a long knife held in a direction to cut the clay with a bevel on it, somewhat wedge-shaped towards the centre. When this second piece has been removed, a third piece, which may extend to the bottom of the work, should be cut away, in the same wedge-shaped manner (see Fig. 50), and placed with the other pieces, and these all covered with a slightly damp cloth, to prevent their drying or contracting, or even twisting, before they are replaced.

The work now begins of removing the clay from around the upright support and lead piping, which you have arranged in the usual way for building up your bust. Care must be exercised to avoid pushing out or changing the form of the work in the front.

Before you begin this operation of cutting up,

Fig. L

THE CLAY BUST WITH ITS THREE PIECES REMOVED, HAVING BEEN CUT AWAY WITH A FINE PIECE OF WIRE AND A THIN KNIFE

the model should have been allowed to get fairly stiff, at all events sufficiently firm to prevent it from sinking when some of the clay is removed and the armature is taken from the inside. Once the upright is freed from the clay all round, and it is seen that the clay is firm enough in its consistency to remain standing upright without support, then steadily slide your work on to a platform or pedestal, built up to exactly the same height and level as the one your work stands upon. This platform must, of course, be placed in front and close up to your model. Only a short removal is needed, and your work is on one stand, whilst the armature remains on the other. Now continue to remove more clay, by scooping it out with a round-ended wire tool, until your work is equally thin all over.

For a work of life-size proportions, such as a bust, a thickness of about three-quarters of an inch is enough; and the pieces taken from the back must be reduced to a similar thickness, due care being taken not to damage the modelled surfaces or edges at joints. You can avoid such damage by putting the pieces down on a soft bed of sacking or cloth, or by holding them in the palm of one hand whilst you scoop out the clay with the other.

With all parts scooped to a proper thickness, you may start upon replacing the pieces, fixing them in such a way that they will not come apart. To do this, you should scratch lines on the sides or joints, through which you have cut, taking care not to come up too closely to the edges and thus destroying the outline where the pieces come together again.

Having well scratched both surfaces of the joint—that is, the one on the body of the work and the

one on the pieces to be replaced, as indicated in Fig. 51—prepare what the potter calls a "slip" of the consistency of cream, or a little thicker, in a saucer or other vessel, by crushing up some of the dry clay of the same colour as your bust is made of, and adding to it a little water. Mix this "slip" thoroughly so as to make it free from lumps; then paste some of this mixture on to the parts you have scratched, and put your No. 1 bottom piece back carefully, moving it about slightly, and pressing at the same time a little until you feel it tightening by the suction.

In order not to destroy the modelling on the parts, it is advisable to handle them with a knife, or, if preferred, a fork, by sticking it into the piece, on its outside or modelled surface, as though you were about to toast the inside surface. This greatly facilitates the replacing of them into their exact position, as the piece can thus be handled with greater ease.

You will generally find that these parts find their own place, especially if a little judgment is used, as the surface from which each particular piece was cut is varied. But extra safety against any fear of losing the exact place of the fittings of the joints may be taken by cutting a sharp line with a knife in several places across where your joint will come (see Figs. 50 and 51), these lines being made at the very beginning and before you begin to cut away the pieces.

When all the pieces have been replaced, take a wooden tool and press the end of it into the joints all round, so as to close them and tie the two parts more firmly together. You will then find a little hollow groove left where the tool has pressed into

Fig. LI

THE BUST AND THE PIECES HOLLOWED OUT TO AN EQUAL THICKNESS ALL OVER

Nothing now remains but to remove the upright peg, cross-piece, and lead piping, after which the pieces 1, 2, and 3 are replaced and the whole left to dry slowly.

these joints. It may be an eighth of an inch, or more, deep in some places, and perhaps the same width, though with experience you will make it less.

Now take some clay, of a slightly harder consistency than your model, and fill these grooves. The chief reason for using a slightly harder or stiffer clay is, that when the work is fired, the joint shows so much less than if it had been of a softer consistency. Moreover, if soft clay is used, it naturally contracts more, and it is therefore likely to leave a crack or opening.

Having filled in all these joints, you will see that a little modelling is required across the surface, which has become slightly rubbed or lost. And with this done, nothing remains but to leave your work to dry slowly, and as evenly all over as possible.

When, after a few days, it shall have become sufficiently stiff to handle, it may be raised upon two pieces of wood to allow the air to get underneath, and inside, so that it will dry more speedily; but under no circumstances should it at this stage be hurried, or the work will crack and twist.

A small hole should be bored in the top, say about a quarter of an inch in diameter, to let out the moisture; and this hole should not be filled in again until your work is back from the kiln, as this precaution often saves a work from bursting during the firing process.

The great secret of firing works of art, such as those a student of modelling or sculpture would require to have done, is that they should be given a slow and soft firing, which means little contraction and less fear of twisting, warping, bursting, or chang-

ing in their shape. It is therefore desirable to give them almost the softest firing possible, just enough only to change their colour and consistency from raw clay to terra-cotta, unless the work is intended to be placed in the open air, in which case it will need a harder firing, so that it may stand the test of the weather, our own variable climate being especially destructive alike to sculpture in stone and in terra-cotta.

But whether the work be intended for exterior or interior purposes, whether it be realistic or decorative, the principles of preparing and drying work which is to become terra-cotta are practically the same, the only difference being that the one which has to stand the weather is fired harder than the other and contracts more. For this reason allowances must be made from the first for this difference, more especially if the work is designed to fit into a particular and limited space or given framework; for terra-cotta is not a material that can be added to or cut away, as bronze may be, by having an extra band soldered on to it here and there, or another portion filed down. So the greatest care is needed to allow of correct shrinkage, which varies from about $\frac{1}{12}$ to $\frac{1}{20}$, *i.e.* from the wet clay state to the time when it leaves the kiln. Of course, the harder the firing the greater the contraction, and *vice versâ*. When the exactness of contraction is a matter of great importance, it is advisable to consult with the person from whom you get the clay, as some clays contract more than others, and in every instance when sending a work to the kiln, impress upon the fireman or foreman of the factory the importance of his giving your model only the firing you wish and nothing more. I have seen many works

absolutely spoilt by a too hard firing, in spite of instructions having been given previously to avoid this.

REPRODUCTIONS OR REPLICAS IN TERRA-COTTA

Should you have more than one copy of the same work to make, a piece-mould in plaster of the original will be required; and with care many copies can be taken from this mould, more especially if the clay employed is smooth and free from grit or sand, though it will be found that an admixture of burnt clay, ground to a grit, or sand will be good for large works. This sand you can get mixed with the clay to any proportion which you may desire by the people from whom you purchase your clay. Even in the case of ordinary modelling clay, the addition of a little sand or grit has its uses when you are modelling a large work. With it the surface never becomes as "tight" or close as with pure clay. Again, it is lighter—an important consideration when a large work is undertaken. Clay with sand in it works up much quicker for use. Then again, it being less tough, lends itself more freely to cutting or carving; although it must be well remembered that for a small work and for a highly finished surface the freer it is from any sign of grit the better. For various reasons, a piece-mould from which you wish to take replicas in clay need not be made of so many pieces as one from which you may have to take replicas in plaster. Plaster will not give as clay will; plaster swells, or expands, whilst clay contracts so much that it will fall from the mould, or leave it of its own accord, if allowed to get hard enough. On the other

hand, if it were a plaster replica which you are about to take, the least undercutting imaginable in the mould would resist all efforts made to remove the cast or separate the two without breakage. In some instances almost the whole of a mask in a clay squeeze will leave the mould without much "pulling" or injury to it, so that it will be easily seen few mould-pieces are required in a head. We speak of a squeeze in clay as "pulling," if it drags by reason of much undercutting, and is put out of form in some of its detail or whole in the process; but in cases when only a little portion of the detail has "pulled" it can almost invariably be pressed back into its exact position again without in any way destroying or changing the modelling—indeed, that any "pulling" has occurred need not be discernible. When removing a squeeze from a mould, discretion must be used in lifting or taking it away, and in such a direction and in such a way as to ease the "pulling" as much as possible. It will be found that in taking a squeeze of a mask from a mould which may be lying flat on a table, any pulling will be lessened if, when lifting this squeeze out of the mould, you will do so a little horizontally (at the same time as lifting it upwards) towards the chin, the reason being that the undercuts are horizontal, as in the nostrils and under the brows, when the mould is lying flat down. The same method should be applied in taking a clay squeeze from the mould of a relief. It should be lifted or pulled in a direction to humour it with and from the undercutting.

A very little practice with a simple example on the "flat" will teach you a great deal about the method of taking away a clay squeeze from a mould.

In no case should a mould from which you wish to

take a clay impression be soaped or brushed with shellac, as the clay would adhere to any such polished surface. Should, however, this have been done previously for other purposes, and should you now require a squeeze from this mould, it will be possible to get one by first applying some French chalk, this being dusted well into the mould, and left there.

The mould from which you wish to take a clay copy should not be either too dry or too wet, but should have just a little moisture in it.

In squeezing the clay in the mould of a bust, begin from the middle of the front half of the mould, *i.e.* say by filling in the nose, pressing firmly with the thumb and fingers, and then gradually working in an outward direction over the face and into the deep hollows and crevices; press all well in, and take particular care that each piece of clay which you put in be pressed against the edge of the clay which has been previously put in. Do this thoroughly, as otherwise lines will show where the two portions have not properly joined together and become one. A great deal of pressure is needed to ensure the clay getting thoroughly into every detail. At the same time equal care must be taken not to break the projecting bits of the mould.

There is danger of the fingers and thumbs becoming sticky, and thus pulling up the clay with the suction. This may be avoided by keeping the hands dry, clean, and as far as possible free from clay. Constantly keep wiping them with a piece of cloth. An even amount of clay should be pressed equally over all parts to the thickness of about $\frac{3}{4}$ of an inch in a life-size bust. First complete filling in the front half of the mould; then do the same with the back half, and fill up level to the joints in both parts, very

cleanly, so that no clay overlaps the plaster edges and prevents the mould fitting up tightly.

Before putting the back piece on to the front and closing up, both the edges of the clay which are to be brought together should be roughed or scratched, and a coating of the same clay made into a "slip" of the consistency of thick cream should be pasted on to these clay edges and into the scratches, then the back mould-piece put on and pressed tightly to the front piece, and the whole mould tied together with strong rope. Then, as far as possible, work the parts together at the joints from the inside with your hands, and a little clay should be spread across with your fingers. A tool may serve to reach such parts as cannot be got at by your hands. When all the joints have been worked together, the whole should be left until the body of the clay has become sufficiently hard to support itself with the outer case and mould-pieces taken away. Then start by removing the back piece and afterwards the top portion of the front case (if this has been made in two pieces, which is usual for extra safety), and the various pieces over the face will now be exposed, and should be removed one by one, naturally the top one first, and so on downwards until all pieces which belong to this top portion have been taken away. Put these, as they are taken off, into their respective places in the case. If you are now perfectly convinced that the clay squeeze is of a sufficiently firm consistency to support itself, you may remove the final and bottom part of the case, and afterwards its mould-pieces one by one, commencing as before from the top. With all these pieces away, you may begin to do such work to the clay as you wish; close up the joints by filling in as you would do when putting together the pieces in an

original model which it is intended to fire, by using clay of a little harder consistency than the model. This only applies to filling in joints, and not to modelling or putting clay on the surface. In this latter case the clay should be rather softer than the body, as otherwise it must get pressed into, instead of being spread over, the surface.

A little modelling over the surface at the parts where the pieces came together will be necessary, but this need mean merely passing the finger over it; and it should be pointed out that if the surface is touched at all, which is almost unavoidable in a squeeze from a piece-mould, it should be worked gently all over, without the modelling being necessarily altered in the least degree. This is done for the purpose of getting the work of an equal colour throughout when fired, for where it has been touched in one place and not in another it will vary in colour, and appear a little whiter in the parts worked upon. A little variety in the colour is agreeable, but you should avoid a patchy appearance. If you pass gently all over it with your finger slightly moistened you will get it fairly even in tint, but practice alone will serve you in this and teach you the different effects to be obtained by working a little on the surface at the last moment, before leaving the work to dry for sending to the kiln.

It should be remembered that nothing can be done to change the form after the work has once become terra-cotta, though much may be done in the way of changing the tone, altering the colour, and improving the quality of surface, from the very dry and porous appearance to a more agreeable effect.

The tone and the dry appearance of a terra-cotta can be changed by an application of stearine, or

beeswax, and turpentine mixed in the proportion of a piece of wax the size of a walnut to a pint of turpentine. The wax should be cut up in thin wafers, put into a tin saucepan or gallipot, and dissolved slowly over a *gas jet* ring. This being done, add the turpentine, and put again on the ring, with gas very low. Here the greatest care should be taken not to allow any of the turps to run down the sides of the saucepan or to get to boiling heat, when it will throw over the sides of saucepan some of the contents, which are *dangerously inflammable*, and almost impossible to extinguish, if once alight, until the whole is exhausted, besides which serious personal injury may easily arise from this cause. Therefore the greatest stress should be laid upon the importance of only allowing the mixture to warm just to a clear liquid of wax and turpentine. A good method for lessening the danger when preparing this mixture is to place the vessel which contains it into another and larger one partially filled with water. This water before it reaches boiling-point will melt the wax sufficiently for use. A thin coat of this may then be painted with a brush all over the work, which, if warmed, will receive and absorb the wax better and more readily than if the wax were applied to a cold surface. Should it be found that the wax dries in a whitish scum on the surface of the bust, it is a proof that there is too much wax, in which case it is necessary to thin it with more turpentine, although warming the terra-cotta still more before a fire will cause the wax to dissolve and to be absorbed.

After the bust has been painted with several coats of the wax, it may be rubbed over with cotton-wool;

and when it is quite dry, *i.e.* when the moisture of the wax has sunk in, a little French chalk can be applied with the cotton-wool and quickly rubbed. This will give additional polish to the surface if it is desired. A further painting with the wax may be applied at any future time if thought advisable. In some instances a little powder colour may be put with the wax and turpentine, which will serve to change the colour as well as the quality of the surface of the burnt clay.

Another method for changing the colour, making it darker or lighter, is by working up with a palette knife some powder colour on a palette, or plate, with milk, until every particle of grit is ground out and it has the appearance of a smooth paste. Pass this through fine muslin into a cup or basin, thinning it with more milk, so that it may find its way through the muslin. When this is done, add milk until the whole has the consistency of something between cream and milk. Then paint your bust over with the mixture. It may be necessary to give the work a second coat, which should be applied by dabbing on with the brush rather than painting or spreading it, and with very little of the colouring matter in your brush at any time.

It may be found, when this colouring has dried, that the effect is a little too equal all over, but variety can quite easily be obtained by mixing a little powdered white lead with some of the colouring matter that may be left. This should be passed through the muslin in the same way as before.

A little of this lighter, and if desired almost white, colour can be dragged over the most projecting parts very lightly and sparingly, and will add to the appearance by reason of the hollows being left darker.

Milk not only serves to fix any coloured matter put on, but gives the terra-cotta a fatter quality and a less porous effect; besides which it prevents the dirt from getting below the surface and into the body, and such dust as falls on to the surface can be dusted off quite easily or wiped with a damp sponge.

CHAPTER IX

MODELLING IN RELIEF

Modelling or carving in relief is one of the most difficult problems of plastic or glyptic art, and requires a long course of study before it can be thoroughly understood and mastered. The fact is that, whilst relief modelling is an art set down on certain principles, and one which can only be properly worked on a fairly generally recognised scientific basis, it is at the same time an art in which there is more scope and freedom for the artist to exhibit his sense of artistic feeling than in a work in the round, which is more nearly a copy of actual nature, moulded, as it were, to the exact proportion in every part, and differing but little, if at all, in form from the actual, save in treatment and feeling.

Relief modelling is like drawing on the flat, and something more, with its perspective and other immense difficulties, beyond those which you only discover as your work progresses. These difficulties are immeasurable; and nothing less than constant study of the best examples, as well as unremitting practice in the art, can be of use to you. But I purpose pointing out certain primary principles that should be borne in mind, and that will prove of great service from the beginning and onwards in your efforts to overcome the more difficult and subtle problems.

MODELLING IN RELIEF

Although there are several treatments of relief modelling or carving, it is usual to speak of two only, namely, Basso (or Bas) and Alto (or Haut). But these have a very wide range, inasmuch as a bas-relief work may be anything in projection from background to front surface—a quarter of an inch, or less, to six inches, or more—and in the same way the alto-relief may be an inch only, or it may be two feet or more in its projection; therefore these terms Bas and Alto refer to the treatment rather than the actual projection of a work from the given ground or wall surface, for the design may be lifted to any distance from such a surface and yet be a bas-relief. It is, in truth, the projection of surface within the contour or contours of any particular part which determines to which order the relief belongs.

Take, for example, a model of the human face in profile. The highest or the greatest projection, say the cheek or temple bone, stands out from the outline of the nose, which may lie on the ground surface, very considerably, almost as much, perhaps, as in the actual life. This, then, belongs to the alto-relief treatment. But if the outline of the face and front of head be lifted—in short, the outline all round be lifted—up from the ground to nearly the same projection as the cheek-bone, and the depth of the hollows from the projections be lessened by being filled in and reduced to a minimum, the treatment will then belong to the bas-relief order, and may, for all that, appear no less true in effect.

The tendency in bas-relief modelling is to get all the hollows too deep and the projections too high.

An excellent method of obviating this is to take a piece of wood, practically a straight-edge, and draw it right over your work, as though shaving off the

top surface of the projections (see Fig. 52). This may be better accomplished if a framework of wood is placed round the work. This framework, which should be equal in height to the greatest projection, serves as a rest for the straight-edge, and not only prevents the modeller scraping too much off any particular part, but determines the highest projecting parts on the front surface. This is an important matter to remember, particularly if the work has to be subsequently carried out in wood, marble or other stone, for the reason that either of the materials mentioned will probably allow of only a certain projection of relief. In this case you would know the thickness before beginning the clay model, and work to it accordingly, in order to come within this measurement.

When a relief has been built with such a wooden framework around it, it is not so likely to get wrong in its projection, the framework serving as a permanent guide in the clay stage for the measurement of all sides as well as for the projection from the ground.

I have often seen quite good effects obtained by the relief being dropped flat on its face upon the floor. Of course, with a large work this is not practicable, but with a small one that has become lumpy and exaggerated in the highest projecting parts, such treatment has, so to speak, knocked it into better and truer relief.

When a student is about to begin a bas-relief he should first of all determine upon the projection from the ground, which he intends the highest part to be, and then provide himself with a flat board with the framework of wood, as described above, fixed upon it, taking care, however, that the board

be made so that it will not warp. Into this framework the clay should be pressed. The wood will thus not only form a boundary line, but, as I said before, a limit for the projections of the relief. It is advisable, when filling in these boundary lines with clay, to drag across its surface the straight-edge, which, whilst resting on either wall, shows when and where the clay bat is level. In this manner you will make sure of an equal thickness all over (see Fig. 52). You have now what might be termed a flat piece of clay, with a front surface which we may regard as the equivalent to a sawn front surface of a piece of stone, out of which a relief has to be carved. You will begin now by drawing upon this clay surface in outline your design, or the subject you may choose to copy. When this has been done fairly accurately, you will start by cutting or scraping down your background and setting back such planes (see Fig. 52) as should be lower in relief, gradually getting one plane behind, and lower than, the other, until you have the relative planes set back in the relief just as they *appear* in the original, leaving the top or front surface to form the greatest projection, and the part which is furthest away from your line of sight in the original, the lowest in relief in your work. The difference of projection from the front surface to the part in lowest relief may be very little, perhaps not more than half an inch, whereas in the original the distance may be anything from the nearest point to you to that of the farthest distance (see Figs. 53 and 54).

This, the first stage with which I have dealt, has treated of the setting back and relative position of the several planes. The next thing to consider is the movement and change of projection from the

Fig. LII

MAKING A RELIEF BY CUTTING DOWN, OR CARVING AWAY, THE BACKGROUND, AS WOULD BE DONE IN THE CASE OF CARVING IN STONE OR WOOD

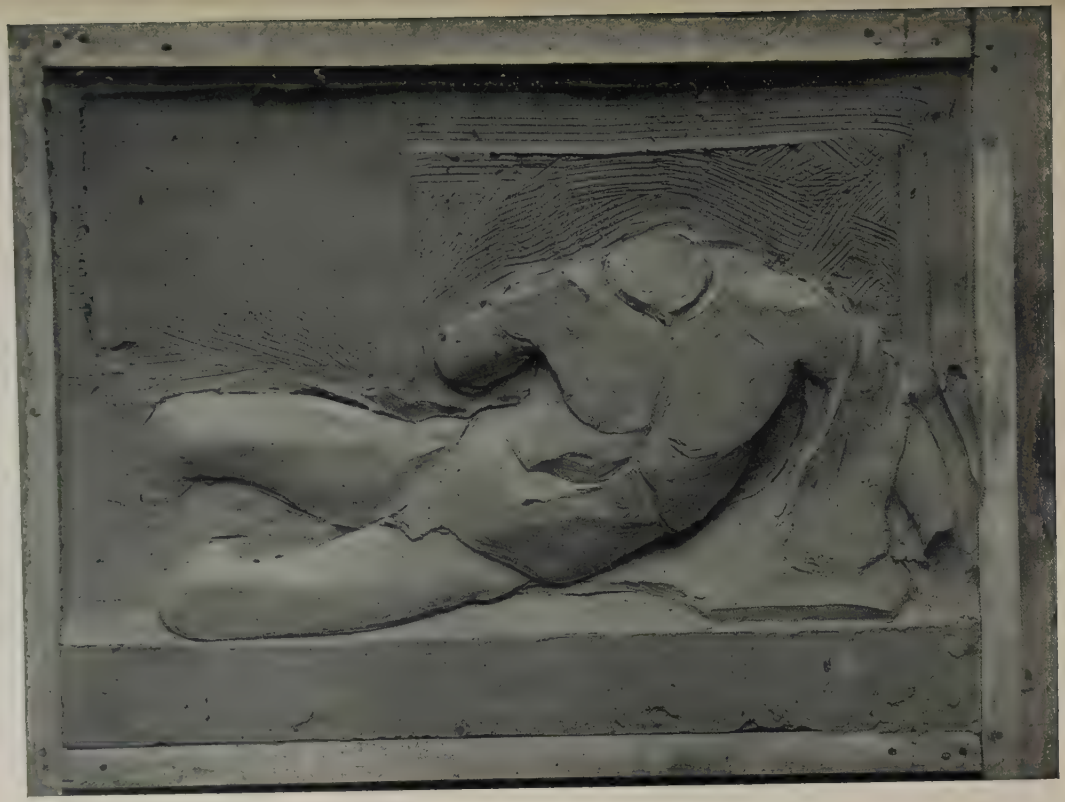


Fig. LIII

THE BACKGROUND NEARLY ALL CUT AWAY AND THE PRINCIPAL PLANES BETWEEN THE OUTLINES PUT IN

Fig. LIV

THE THIRD STAGE SHOWS THE DETAILS PUT IN AND THE SUBTLETIES IN THE LIGHT AND SHADE INTRODUCED

ground surface of the outlines, and the planes which give a certain fulness on the surface, or body, into which further detail will eventually be introduced; but the varying outline and the projection of one part relatively to another is a most important matter to bear in mind, for when this is thoroughly well mastered, a relief can be quite beautiful and yet its surface in and between such outlines have scarcely any modelling or form.

Indeed, these surfaces may be absolutely flat, as some of our earliest examples show, or damaged, as in the case of many famous antiques, to such an extent that everything is quite obliterated or rubbed away, whilst the outlines in all their completeness are beautifully preserved.

It is the truth in the outlines of the relief works of Donatello which gives that great charm to the Master's work. The drawing and colour in the outline is only obtained by the correctness in relief of one part to another, expressed with tender touch.

All the charm and the exquisite modelling and drawing on the surfaces would count for little were it not for the purity of light and shade in the drawing which outlined them.

I point this out to show that it is most important for the modelling student thoroughly to master drawing on the flat, always remembering that an outline is ever varying in its colour and direction or movement, ever losing itself behind, or coming in front of, another part; that it is at one time nearer to the eye than at another; that one muscle is crossing over another, and sometimes over and round the body, and that they are not all hanging down the figure like a lot of ropes, which would give an equal projection of outline throughout, and which,

if modelled in relief, would mean that the entire outline, to be a correct copy, must be an equal distance or height from the background at every point.

Imagine the monotony and crudity of such a work, and the uselessness of the most careful modelling on the surface within such an outline!

It must not, however, be thought that in relief work drawing is confined to the outline only, for there is much and very important drawing required in the detail on the surfaces, even though in a very low relief this is quite subtle, so much so that it is only to be seen when placed in certain lights. A relief should be worked in the light in which it is intended ultimately to be seen, when this is possible, and when it has been designed for some particular place and not done merely as a study for practice. Even in the latter case you should, when working upon it, place it so as to get the light and shadow as you wish them; although it is advisable to change the position of your work from time to time, during progress, viewing the different effects under different lights.

It will be found that under one light, that which was a shadow has become a light, and *vice versâ;* but the shifting of your work from one place to another, at different times, will enable you to model such parts as could not be seen in the previous lighting. Ultimately you will get it back to its original place and lighting, and discover how much remains to be done; and you will set to work upon it with much freshness, getting with more freedom much that you have been striving after, overcoming that staleness which had dismayed you before moving into other lights—a feeling which must be got rid of at any cost, as it stultifies your best efforts, depressing and dis-

heartening you, as though some blight had fallen on the work in hand, making it flat, stale, and unprofitable, and filling the heart with distaste for the labour of the hands. But remove your work and see it under another and changed aspect, and it will prove an invariable cure; inspiration and enthusiasm will come to you afresh, and no longer will your labour seem in vain, or the work cold, dull, or uninspired. Or, should this not alter the state of your feelings, leave the work, go for a long walk, or visit some museum and get into the presence of those mighty examples of sculpture, deathless and beautiful through all ages. If these things are of no avail to cure you, go to bed, for no amount of time spent on a work on which you are not keen can produce any good result.

Relief modelling is not like a work in the round, where, by turning your model, you can get at any moment an entirely fresh view to renew your enthusiasm when you have become slack on one view.

Up to the present I have dealt more especially with one kind of relief, namely, a fairly high bas-relief, such as is shown in Fig. 54, where the planes were cut down and very decided; but there is the very low relief, the high or alto relief, and the treatment of relief which is both high and low, as in ornamental or decorative work, all of which require a different method of treatment and cannot be cut down in the manner I have explained, but should be built, or modelled up, from the background.

Now let us take the very low relief. This, when sketched in on the clay background, should grow up very slowly, first by clay being spread in the required form over the parts which are to be in greatest projection, and the groundwork being left

Fig. LV

A Bust in the Round, from which the Relief shown here is made

From the original bust by the Author.

to serve for the lowest parts, as shown in Fig. 56, until you have your projection all put in fairly correctly. Then you may spread clay on the lowest parts, Fig. 57, and then proceed to the intermediate planes, leading up to the top or highest projections, Fig. 58.

One important thing to be remembered is, that every part must be of some degree of relief from the ground, and relatively correct one part to the other. An error very frequent with students working at low relief is, that they dig or cut into the background until one or other part is below the surface. In the finest examples of relief work this never occurs; and, for this reason, I am not sure that the student, in first beginning to do low relief, would not do better modelling direct on a board or other firm surface for a background, instead of working on a soft clay slab, except that a clay model in low relief would dry and crack and then fall off. Indeed, the method is not practical, although it is followed sometimes on a slate or a piece of glass, and invariably with small work on a plaster slab the surface of which has been coated with soft-soap to stop its quick suction and yet make it sufficiently polished to cause the clay to adhere. In this latter case the clay can be kept sufficiently moist if the back of the plaster slab is sprinkled with water to keep the model in good working condition.

Then again, many very low reliefs are worked in wax on a board or plaster slab; in the latter case this slab, when quite dry, is given two or three coats of French polish, so that the wax will adhere to it. A piece of glass or slate is sometimes used instead of the plaster slab. These substances having a

Fig. LVI

THE FIRST STAGE OF BUILDING UP A HEAD IN LOW RELIEF, WHERE THE GREATEST PROJECTIONS ONLY HAVE CLAY YET UPON THEM

The nose and chin are seen merely in outline.

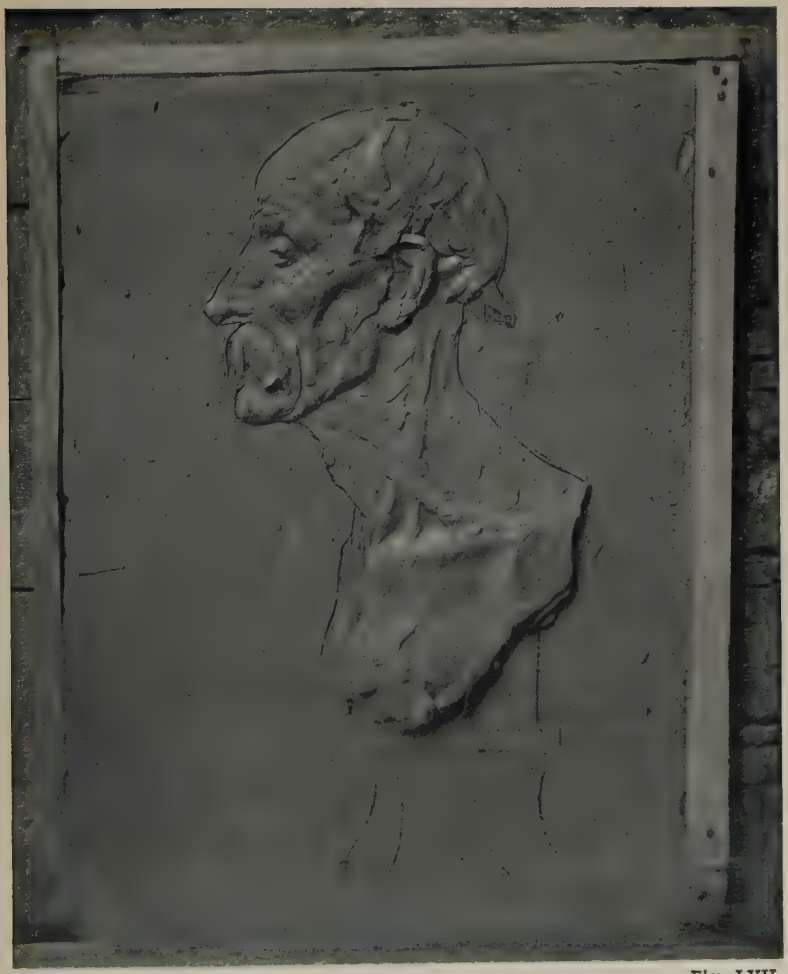


Fig. LVII

SECOND STAGE SHOWS CLAY PUT ON IN THE LOWER RELIEF PARTS, SO THAT THE GENERAL MASSES, AS WELL AS THE DETAIL, ARE INDICATED

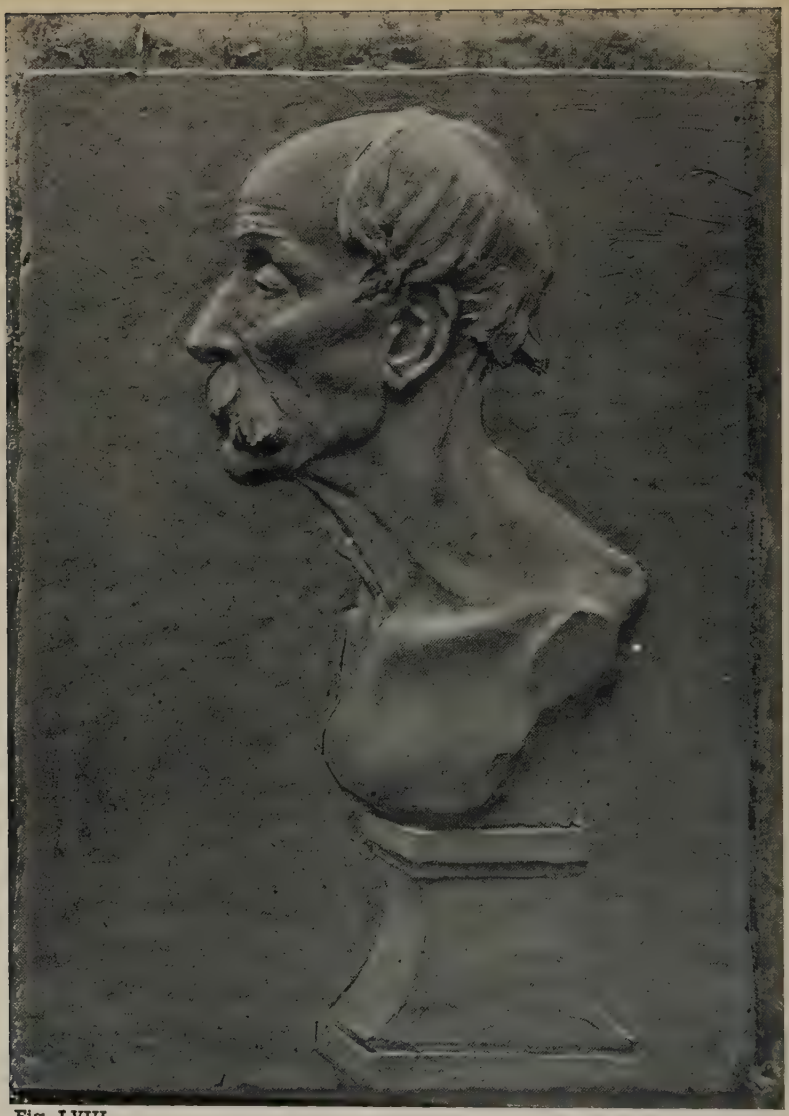


Fig. LVIII

THE FINISHED STAGE, WITH THE MASSES AND DETAILS BROUGHT TOGETHER AND THE HALF TONES MADE OF VALUE, THE GREATEST PROJECTIONS NOT BEING MORE THAN ONE HALF-INCH

somewhat polished and non-porous surface, the preparation mentioned to hold clay, wax, or plasticine is not required.

Whichever medium be used, or whichever background be worked upon, the method and principle of very low relief modelling are almost the same, the chief object being to get an agreeable arrangement for the display of light and shadows, together with interesting shapes alike in the work and on the background.

No amount of beautifully wrought detail can make a fine work, unless these qualities are in evidence. A relief, like almost every other form of art-work, should primarily be beautiful at a first general view, seen as a whole; and beautiful detail should be found, on closer examination, within this whole, as an enrichment. What little value have the most costly stones set in an ugly shape, except their glitter? Any bits of common glass can be equally interesting in this respect. Therefore relief work must be regarded, more or less, as a design, a beautiful arrangement of a something—a head, a figure, an animal, or piece of foliage—on a background. The student will do well to bear this in mind, and he should ever view his work at a little distance away (and particularly remember to keep his, or her, nose off the clay, as common a practice as I know of—next to going to sleep over it). Constantly keeping on the move and getting back from your work keeps the mind awake, as well as the body, and the faculty of concentration alive. It should be remembered that concentration is an important factor in the making of all great work, and the student exercising this faculty as much as possible is bound to develop this power. The student

who allows his mind to run astray on side issues, when engaged upon a serious work, cannot possibly be doing his best. It is therefore far better for him to work alone, or forget that others are with him. I dwell upon these points at this moment particularly, though they should honestly apply to all the other chapters, but I feel that in low-relief modelling there is generally so little work that does not require your entire and undivided thought upon it, that no earnest student can afford to have his attention diverted, or his mind set upon a single thought other than that which is directly connected with the work he is engaged upon. In low relief there is so little, even from the very beginning, that does not call for your entire attention. In other forms of modelling there are generally some preliminary stages before the actual modelling begins; and oftentimes laborious work has to be done in getting up the armature, and in the early stages of building up and fixing points, which can be done more or less mechanically. Needless to say, it must be remembered that these matters require great care and attention, but not the same serious concentration as working in low relief, when from the first the earliest touches may be almost final, and if not so, may be of value, and each piece put on, or cut off, of some definite purpose.

Of relief work, generally speaking, it may be said that it is not until you begin a work in the alto (or high relief) that any structure other than a board is required; but in a high relief of any size at all a great deal of time has often to be given up to arranging the armature and framework upon which to build your clay. This often occupies days of work and uses up an abundance of lead or compo piping,

wood, and sometimes iron rods twisted or bent in the various shapes necessary.

I do not propose here to instruct the student in work on a very large scale, but rather to confine myself to sizes such as can reasonably be worked under ordinary conditions, say as a maximum some 5 or 6 feet square, quite large enough for the most ambitious student. It is not size that counts, but quality.

We will suppose that a student wishes to model a high relief of any size within these dimensions, and say, for instance, of a figure subject such as shown in Fig. 59. He would require to build up an armature of the kind shown in Fig. 60, that is, supposing it to be a copy of something, or of a smaller model of an original design (which he has carefully prepared and built upon a similar, if lighter and smaller, armature before venturing upon the larger or more ambitious size). Then he will first have to provide himself with a well-made board, with strong battens nailed or screwed at the back to prevent its warping, and fix the whole up as nearly vertical as possible. This done, he must next begin to fix on (with nails) his lead or compo piping in such places and directions, and bent to such shapes, as required. "Butterflies" will also have to be hung from the wooden background. These, as well as the lead piping, are more especially advisable when you are enlarging a work of your own design, because of the fact that you will invariably find that your work, when enlarged, does not give you quite the same effect or satisfaction as it did in the smaller or original model, and thus the ease with which the lead piping and the "butterflies" can be hammered in or pulled out, or moved in any direction, is most advantageous, whereas

Fig. LIX

MATERNITY

One of the bronze panels on the Queen Victoria Memorial, erected at Nottingham.
By the Author

Fig. LX

It will be noticed that a cage-work of wood is made, upon which to build the figure; by this means the clay model will be much lighter. Additional "butterflies" and pieces of wood should be attached to the lead piping.

much difficulty would be occasioned by the use of a less pliable material, should a change be desired or necessary.

I have said that a relief upon which you are at work should always stand quite vertically. This is extremely important, except in such a case as when the work is to occupy ultimately, and is designed for, any position other than vertical—a slope, or tilt forward—when it should be worked, so far as possible, at the appointed angles.

When the wooden structure and the armature for the large work are complete and carefully set up, and each "butterfly" bears its correct relative position, then the work of building up the clay begins, and points are taken (Fig. 61).

In high-relief work it is necessary to remember from the first that richness and fulness of quality in the lights and shadows are important matters for consideration. Well-rounded forms rather than flat, play of line, and contrast of planes are qualities which tell best, and subtleties are of less value than in the lower relief. The alto-relief is usually a work done to be seen from a greater distance than the bas-relief, and thus the effect should be in every way stronger, so that it may "tell."

High relief, if to be placed in or on a building at any great height, requires a great amount of thought in arrangement as well as in execution, for it is the commonest thing imaginable to find what may have looked quite an effective and fine work in the studio utterly changed in appearance, and all its qualities lost, when placed in its allotted position. The knees of a seated figure may be so arranged as to cut off the whole of the upper part of the figure and leave but a shapeless mass to the observer from below;

Fig. LXI

When putting on the clay in this first stage it is important that it should be squeezed well in between the wooden laths, so that it will bind round these.

again, a shield or other attribute may be worked with the same result. For this reason the student should for ever (during the progress) be looking up at his work from an angle as near as possible like the one from which the work will be seen when placed in its position. This applies particularly to work designed for a special purpose and position. I would point out that, in modelling a figure seated (front view) to be placed high up, it is advisable to let the figure be seated much higher, and the legs at a much greater slope down from the body to the knees, than you would if the same figure were done to be seen at a lower plane or level. And avoid the extremities, the arms or other parts, to project in such a manner as to cut off or hide from view the head or features or such parts as you may wish to be seen. In short, let all your efforts be of some avail, wherever placed and by whomsoever seen, if they are worthy of you, and waste them not on the desert air.

CHAPTER X

MODELLING FOR BRONZE, ETC.

The most permanent material which can be used for modelled works of art is probably bronze, as it resists the destructive influences of adverse temperature, as well as the natural decay to which less concrete substances are subjected; as witness those works of great antiquity which in a most marvellous manner have remained to us through countless ages, and are to-day as perfect, in some notable examples, as when they came fresh from the creative hand of the artist thousands of years ago.

The material, whether clay, plaster, wax, plasticine, or plastique, in which one may work for subsequent casting in bronze, matters little in most cases. But, I do say, it is a distinct advantage to use such material as most nearly approaches the colour or tone of bronze, for it will be obvious to the most inexperienced that the change in the effect of a model worked in white, even to the lightest colour in bronze, must be considerable; and such a transformation would, at least, be surprising and, in a number of instances, more than likely a disappointment. For this reason, plaster, being white, is the least desirable material of all for modelling a piece of sculpture which is to be ultimately cast in bronze. Although it is quite possible that either clay, wax, or plasticine may be white, or nearly so, they are

as a general rule of a much darker tone, and more nearly approximate the colour of bronze; besides which, the moisture of the clay and the oiliness of the wax or plasticine make the model catch stronger and brighter high lights, while darkening the shadows, so that the effect more nearly resembles that of bronze.

A work intended for bronze calls for, and allows of, a treatment quite different to that of any other material; and this should be borne in mind all through the working. This treatment is quite the opposite to that of stone, in general as well as in detail.

Work treated with even unlimited freeness can be reproduced or cast, in metal, without losing its effect, or becoming so thin and fragile as to get easily broken; nor need one fear that it may even be damaged by handling. A figure in bronze, of heroic size, in the action of flying through the air or soaring to the skies, even with an abundance of outstretched drapery, may have but the toes of one foot touching the ground to support it, and yet look perfectly safe and easy. Were the figure treated in the same way in any other material than metal, it would appear, and indeed would be, wrong. It would convey the unpleasant idea of being unsafe, even though it remained standing up a sufficient length of time to be looked upon and criticised.

In modelling for bronze or any other metal, there are few limitations and many advantages, for almost anything can be done by the different processes of bronze casting; and a work which looks well in the various stages of progress will generally look better when cast in bronze (that is, of course, if it is worked for metal). By this, it should be remembered, is

Fig. LXII

A Figure designed expressly for Bronze, where it will be noticed that the immense Mass above is supported only by the Toes

From the statue by the Author.

Fig. LXIII

THE SAME FIGURE SHOWN IN PROFILE

The student will easily recognise the unsuitability of this work for marble or other stone.

meant that a sketch in clay, or a work only finished in parts and the remainder quite rough, will gain by being converted into that more durable material; for bronze in itself is quite beautiful with its varying patina, more especially if proper care is taken of it, and if it is not left in the hands of the town authorities, who receive perhaps a statue on behalf of many "subscribers," and from that moment cease to take any further notice of it, save perchance to wash it down once during their term of office. Then, alas! it is left to grow coated over with mud and smoky grime, as though it were of no more artistic value than a chimney-stack; and then, what happens? The people criticise this mournful and forlorn-looking object by calling it nasty names, when the expenditure of a few pounds a year would reveal to them a fine piece of art, perhaps a nobly inspired and admirably executed masterpiece.

I merely point this out because I wish it to be known that a bronze, be it small or large, requires care and attention, and if these are given its fine qualities, so far as the metal goes, are quite likely to go on increasing. Time tells a beautiful tale on it, and in this respect it has a distinct advantage over stone.

In modelling for bronze you may be very exact as regards the imitation of different textures or surfaces, such as those found in drapery or the hair. Moreover, you can keep your details much nearer the scale of the original. For instance, such things as draperies standing away from the figure or main body, or hair, can be made much thinner; wings, flowers, and accessories of all kinds can be kept much nearer to the delicate proportions of nature than would be possible in marble carving—so thin, indeed,

that they would be more than likely to break in their plaster stage, *i.e.* when being moulded or cast into plaster, although in this latter case little harm may be done. Such breakages can be easily mended, or made up, before the work goes to the foundry, where lost or damaged parts may again be touched up or finished off. It is even possible to make additions to the model in its wax state.

These remarks apply to work that is being cast into bronze not by the sand process, but by the *Cire-perdue* method, which process is to be regarded very highly, particularly for intricate works of not too large proportions, which are to have small pieces projecting from the main body of the work; because much may be done, if it is necessary, in the final stage, either at the foundry or at your own studio, before the work actually appears in metal. The particular wax used by the founder in the process is of quite a different kind and consistency from ordinary modelling wax, and is not easily manipulated without some little practice.

At this stage of the work, this material enables you to do many things which would be extremely difficult, if not impossible, in clay. It is therefore advisable and important for the student to practise working in founder's wax, so as to be able to manipulate it when the occasion arises. Whilst advantage may be taken of these possibilities, it is far from wise to place too much reliance upon alterations which can be effected in the last stage; and it is fatal to leave any experimentalising until then.

Properly speaking, the final stage should be looked upon as a last opportunity for replacing or touching up only that which may have got lost or damaged

after the model has left your studio. If the sight of your work in a new material should happen to suggest to you the advisability of certain slight changes, then this is a different matter, and you may indulge in an experiment.

Parts of the work may require sharpening, the detail appearing somewhat less marked than in the original model; but this may be in appearance only, and is accounted for by the dark colour of the wax which is generally used by the founder. No great amount of scraping down or cutting away can be done, for it must be remembered that this wax is only cast to the thickness of about a quarter of an inch, or less, in a figure of half life-size proportions; and this thickness represents the thickness the metal casting will be. It will be recognised that a work in wax of such thickness will naturally be very light, and not only breakable, but liable to warp, sink, or change its attitude by falling over to one or the other side, or a little to back or front, unless it be kept in so cool a place that the wax remains hard enough to be in a brittle state, and quite firm enough to support itself. To keep it in this state of rigidity in hot weather, or in a hot room, is quite impossible. It is therefore best, at such times, to let the founder follow what is usually his custom under such conditions of high temperature; which generally is, to fill in the core with his sand composition, which must eventually be done in any case before the casting, or the cast, if taken without such filling from a work in the round, would be solid. That of course, would never do, for obvious reasons.

The best means of working on the model, when it is in the founder's wax, is to keep by your side a lighted candle, and occasionally to put the steel

tool you may be using into the flame, making it sufficiently warm just to melt or soften the surface where it is touched. No matter how good the wax cast may be, there is always the seam showing the joint of the moulds from which it has been taken. This must be removed, if possible, by the artist himself, and not left to the founder or, worse still, to one of his assistants.

It is a great advantage in the casting of bronze by the *Cire-perdue* process that, should you desire at a later stage to do something more, it can be done; and another and perhaps greater advantage of this process over sand, especially in the case of a work in the round, that there is no cutting up of the original model into many parts and subsequent jointing or bracing together. No matter how intricate or undercut the work may be, it is quite possible to mould it, and then to cast it into bronze, in one complete whole. More especially is this done in every case where the work is executed on a small scale.

When the work, either on the flat, in relief, or in the round, is of heroic size, or even larger, or when it is very simple in treatment and without much small undercutting, then, but for the fact that it does not pass through another stage which permits your working upon it before the final casting, the sand process has its advantages over that of the "lost wax."

In modelling for bronze, it must be remembered that though anything may be transformed into metal, artistic considerations impose strict limitations. I mention this in order to point out that although the process allows of much greater freedom in the treatment of modelling, it should not

be abused to the point of coarseness, carelessness, or raggedness in workmanship.

Again, extravagance in attitude, movement, and treatment of detail, as well as of masses, is an error into which one can easily fall in working for metal, but one which should be most carefully avoided, otherwise your work will look "noisy," cheap, and restless—faults far too common in many works in bronze, and especially noticeable in the works of some foreign sculptors. The grotesque has its undoubted place in sculptural art, as in any other, as witness the leer of a Bacchus, the *diablerie* of a satyr, the horrid grin on the lips of a demon; but true art, no matter in what material, and no matter what subject, should be peaceful and not disturbing. The abnormal in art is usually the abominable, and, for the most part, is only sought and practised by those whose chief desire seems to be to shock decent susceptibilities, and to enjoy the brief and scandalous notoriety produced by their works.

The wildest, fiercest animal, no matter how realistically treated, should not inspire the beholder with fear or terror, so that he would fly from it, but, as an example of the power of art, should fix for ever the savage beauty, the strength and the ferocity, which inspired the artist to its exemplification.

Generally speaking, in modelling for bronze it should be remembered that a broken surface reproduces better than one closed, or what is termed "tight" or "close," for the reason that it collects a greater variety of colour in the metal, and keeps down, or breaks, what would probably be a more polished or marble-like surface with a number of unduly large patches of high lights; although this remark does not hold good if a work be finished

as a master would finish it, as is shown by the wonderful bronzes of the Japanese. Yet in the case of the Japanese bronzes, it will be found that the plain or smoother surfaces are but rarely large in size, and are frequently in juxtaposition to more broken parts.

In short, it will clearly be seen that the hammered or beaten surface of metal is distinctly more interesting than the quality which is found on the surface of an object turned on a lathe, in the same material.

Nothing can be more unsatisfactory or unlike anything in nature than the tight surfaces on the cheap statuettes in bronze, which are to be seen in the windows of our ordinary shops where they sell anything but art products, and which are the delight of the uneducated lower middle classes, who love "ornaments."

So uninteresting are these pseudo-bronze arrangements as to suggest that only a lathe, and good sandpaper afterwards, could have produced such cold, unsympathetic stuff. Limbs and bodies alike show no suggestion of the modeller's surface work, technique, or manipulation—if, indeed, there ever was any such suggestion when it left his hands. And this in the face of the fact that it is one of the huge advantages of having a work in metal, that the minutest imprints of the fingers can be reproduced as sharp as in the original.

All these minutiæ have a value on the surface of the metal, and the student will do well to study quality of surfaces when modelling a work for bronze, and to learn how to make such surfaces interesting, rich, and free from monotony. Large, empty, or plain pieces are not of as much value in metal as they may be in marble or other stone. In bronze, a piece of

Fig. LXIV

A Corner of the Author's Studio

drapery may be as flickery or flashy as the tongue of a serpent appears, and yet look well; but not so in marble. There are some things which are distinctly suitable for execution in metal, but are impossible or bad in other materials, and *vice versâ*. And therefore it should be the purpose of everybody practising the art of modelling, or sculpture, to acquaint himself with these differences; for often does a work lose much of its artistic value from being either improperly considered during its creation, or from being reproduced in the material for which it is least suitable. Experience teaches much; but close observation and the study of the good examples in our museums and galleries will help, surely and speedily, to teach the treatment and surfaces which are of use, and the qualities to be obtained in metal.

Contrast these with the effects obtained by appropriate treatment of marble or other stone. Compare their values, not only in the mass, but in detail; and you will, by experience, arrive at the relative values of all materials.

Again, by bronzing, or tinting bronze colour (in a way pointed out to you in another chapter), one or more of your studies, you will learn to know, approximately, the particular parts that suggest themselves as being right for metal; and you may further experiment on such parts as seem wrong, and colour or bronze over those parts again, to see if they have become more nearly metallic in character or workmanship.

Such experimenting is often a most valuable object lesson, and practically indispensable, when it is proposed to cast the work in bronze. But in the latter case such experiments are best made on an extra cast

of the same work in plaster. If you have none by you, it is quite worth the slight extra expense to have a second cast made in plaster for this purpose, if the work be worth casting into the actual metal.

THE PROCESS OF CASTING INTO BRONZE BY THE *CIRE-PERDUE* METHOD

The *Cire-perdue* or lost wax process of casting in bronze is the one which was practised by Benvenuto Cellini and his contemporaries when they wished to reproduce their models in metal, and there is no doubt in my mind but that this method, so much adopted by the Italians, and called by them *Cera perduta*, is the best means of converting into bronze a model which has many intricacies and much undercutting, or a work which has free pieces—*i.e.* pieces standing out or away from a body or mass, though attached to it. But whether it is as good a method as the sand process for large work, depends to a very great extent upon the arrangement and treatment of the subject to be cast.

For heroic and colossal work which has not an abundance of undercutting, free pieces, or intricate detail, the sand process cannot well be surpassed.

To obtain a bronze by the *Cire-perdue* process, you must supply the founder with a copy in plaster of the work to be cast, though in some instances the clay model, after it has become stiff or firm in consistence, will serve; but there is always a risk in sending to the foundry a clay model, which is, as you will know, so very fragile that your original may quite easily get broken, especially if it has any delicate semi-detached parts.

With a work which is not more than two or three

feet in height and width, and one which is quite simple in arrangement and treatment, or with a simply treated work in relief, and where it is necessary to save the extra outlay of a pound or two for casting into plaster, the founder will with fair safety make his model direct from the clay.

In any case, the work, be it either in clay or plaster, is given in the first instance a coating or two of shellac (French polish) by the founder; he then proceeds to make a gelatine mould over it (in the same way as described in the chapter on Gelatine Moulding), except where the work is of large proportion; then a plaster piece-mould is made. A wax casting is taken from this mould, of the thickness which the bronze cast will be when it is made, such thickness varying according to the size of the work. In a life-size figure it would be something about $\frac{1}{4}$ of an inch, or a little more, throughout.

Before the wax casting is removed from the mould, the founder fills it with a special composition of brick dust and plaster, made to a paste consistency with water; this forms the mould, so to speak, of the inside of the wax, and is called the "core"; it also serves to support the wax cast when it is taken from the mould, and also prevents it from twisting or changing in any way from the effect of heat, as it would be liable to do in hot weather.

When the brick-dust composition has become sufficiently set, the outside mould is taken away to expose the wax casting; to this casting some touching up may perhaps be necessary, and this by the sculptor himself; and if it be a work in the round, the seams, formed by and where the mould-pieces come together, will require to be removed.

The founder next arranges his pins, ducts, air-jets,

and runners. The pins are little sticks or straws of iron (their thickness and length varying according to the size of the work), and are used for passing through the wax at different points, and into the composition core, the ends being left to project a little way outside the front wax surface, so that they will be embedded in the composition brick-dust covering when this is put on the outside surface of the work. The purpose of these pins is to hold the inside composition or core and outside composition mould in their proper relative places or positions when the wax has been melted out, as explained a little later. Without these pins the core could, when the wax is removed, easily tumble over to the sides of the outer mould, and your bronze, when cast, might have no thickness at all in some parts, and too much in other places.

The ducts are straws or pins, so to speak, made of wax, and these are placed from the body or other mass to the extremities of an extended part, such as to the fingers of an extended arm, and serve to make channels through which the metal may pass and feed such parts, as well as its (the metal) passing down the main aperture of the arm—*i.e.*, say, through the shoulder. These ducts also serve as passages through which the air can be driven, and thus assist the metal in running up into these tips.

Next the air-jets are arranged; these are placed in different parts of the work, and are extended far enough to project above and outside the outer mould, when this is made, so that the air in the mould will be driven through them when the molten metal is poured in.

The runner is a roll of wax thicker and longer than the ones already spoken of; this, when melted

away, forms the aperture through which the molten metal is poured.

When all these straws of wax are placed on the work the outside composition mould is made, and the top of the runners and vent jets alone stand exposed a little above the surface of this.

The mould is now left to dry and get firm, and is arranged in the pit. It is then built around with fire-bricks to form a kiln, and afterwards fired or baked until the wax is melted out of it, and it is absolutely freed from moisture. Next the bricks are removed and the mould is packed all round with sand, to hold it firm when the metal shall be poured in.

By this time the mould may have cooled down to such a heat as the founder thinks proper for the next operation of pouring in the molten metal. This the founder alone is able to tell: it is a matter requiring great judgment.

The molten metal is now poured quietly in to fill all the parts left vacant by the *Cire-perdue* (lost wax), and there is now nothing to do but to wait for it to cool; it may be a matter of days in a work of big dimensions.

When the metal is cooled down, the founder watches anxiously the removal of the outer moulds, which have become somewhat softer by the firing. In quite a short time these are knocked away and the casting is exposed with its network of pins, ducts, air-jets, and runners; these are removed by saws and chisels, and if well done leave no trace of their having existed.

The work is now cleaned in a weak bath of sulphuric acid, and eventually in a bath of clean water.

Further touching up may be done with small

chisels and riffles, perhaps, by the sculptor himself, and then comes the question of colour.

It may be the sculptor prefers to have his work in its natural colour, just as it came from the mould; or it may be he wishes it with one or other particular patina which will be obtained through the effect of various weak solutions of acids—muriatic acid, cyanide of potash, sal-ammoniac, and other chemicals being used.

A bronze cast in its natural colour, as it comes from the mould, will improve greatly in its appearance through the effect of the atmosphere upon it, and an almost daily wiping over with the hands will assist it, there being a just sufficient oily moisture from the flesh to be of service.

SAND CASTING

In casting a work by the sand process, more particularly one which may be in the round, there is less risk of its being out of the plumb, falling over to one side, twisting, or warping, even when the greatest care is exercised, than there is by the waste wax method; for it will be easily understood that a work such as a figure in the round, with little but a thin bearing at the base, as across the ankles, and with a big mass above, can easily fall a little to one side, or backward or forward, when in its wax stage, unless it is very carefully supported and propped, and has a core inside it.

The sand used by the founders is one rich in loam, and when ground it is made sufficiently moist to make it cling together without breaking apart. A "parting dust" (generally a brickdust) is used to prevent one piece or core from adhering to another.

In some instances the sand-casting process is less costly than the *Cire-perdue* (waste wax) method.

The making of a sand mould is similar to that of a plaster piece mould, where (as I have said in the chapter on mould-making) a number of pieces are made, each separately, at such parts of the model as are undercut, and the whole of these pieces covered with an outer case or shell. This shell, when removed, serves to hold all the pieces, which are taken off one by one and put into their respective positions.

It is practically the same with making a sand mould for bronze casting, except that sand is used—that is to say, crammed in—in place of plaster, to make the pieces, or, as the founder calls them, the "false cores," and also the shell. Around this shell there is placed an iron "mould box," as it is called when used for a small work, and "mould frame" when for a large work, and this is fitted together with pins and lugs, after which more sand is rammed in to fill this "mould box" until the level of the top is reached.

Where a mould is to be made over a work (or part of a work) in the round, it is necessary to do it in two (or maybe more) sections, a back and a front set of false cores, and a back and a front shell to hold these. When one section is complete the whole (the mould and model) is turned right over bodily, and the mould ("false cores" and shell) made on the other side in precisely the same way, though it may require fewer or more "false cores" according to the amount of undercutting. When this side has been made the mould is divided by first taking off the iron mould boxes, then the shells, and eventually all the "false cores"; the latter are then put back into their places in their shells. The plaster model is now

placed on one side, and the "core" is next made, with an iron framework inside it for strength and support. This "core" is practically a replica in sand of the model, and is formed by stuffing the two whole moulds with sand, and afterwards closing them together; then the "frame boxes," "shells," and "false core" pieces are again removed in the same manner as before, and you have your model, so to speak, in sand, with its "lanterns" or tubes inside it, each just extending outside at one end to allow the gas to escape when the molten metal is poured in. The whole of these parts, *i.e.* the "shells," the "core," and "false core" pieces, are then placed in an oven to dry; and when thoroughly dried are removed from the oven, and then a thickness is pared (or cut) off the "core" (sand model) equally all over; this thickness which is removed will form the thickness of the bronze when the casting is made.

The whole mould is again carefully put together with the "core" inside it, the iron "mould boxes" put round, and these securely pinned up with strong steel screws; the mould is then ready for the molten metal to be poured into it.

Through the "core" two rods have been placed at right angles. These rods reach through some little distance into the "false cores," and serve the purpose of keeping the "core" in its exact position in the mould, for it is obvious that with the thickness pared off, it would otherwise move about, and cause the casting to be thicker in one part than in another.

Besides these two iron pieces, other small branches called "Gits" or "Gets" are put inside the "core" to serve as feeders to various parts of the mould, through which the metal can pass as well as the air or gas.

A basin is put over the mould at a place where an aperture has been made through which the molten metal can run. In this basin there is a plug with a long iron handle, which is surrounded by loam, to prevent the molten metal from coming into contact with the handle.

When the metal is poured into the basin the plug is withdrawn, the metal enters the mould, and the casting is formed.

After sufficient time for cooling has been allowed, the work of removing the mould is begun by chopping it away, and in a short time the model, or that portion of the model which has been cast, is exposed in its bronze form, and nothing remains but to remove the "Gets" (the workmen call them the "Gits"), the feeding tubes, &c.

This portion, if it be a part of a whole, is laid on one side until the other portions are made, when all pieces are riveted together, the joints closed up, and you have your model in bronze, cast by the sand process.

Instances have been known where a life-size horse, with its head, tail, and legs on, has been cast in one piece. Although it is possible, this heroic method of procedure is not considered advisable; and, moreover, it is far more costly than when the casting is done in parts.

Casting by the sand process is in general much the same as by the lost wax, excepting that in the sand method the sand mould into which the molten metal is run is made direct from the plaster model.

This method generally necessitates the model being cut up into more pieces than in the *Cire-perdue* process, and the work is seldom cast as a whole. Being made in parts, it is joined together afterwards,

which is done so skilfully by the best founders that any sign of joining is imperceptible.

THE ELECTROTYPE DEPOSIT

The electrotype process gives you the most exact reproduction of your work in metal, the minutest details imaginable being brought out in facsimile; and the whole work does not suffer through contraction, as it does by the casting method.

An electrotype deposit can only be made in pure metal, whereas in the casting process an alloy can be used in proportions of copper, tin, and zinc; and this alloy possesses a quality which appears to have more life in it than the pure metal has; but for perfect accuracy of reproduction the deposit method, when well done, cannot be equalled, and in durability it is said by some people to be equal to cast work.

Many of the statues and public monuments abroad are electrotypes, and are said to be of the same substantial thickness as castings.

Deposits of the ordinary class are despised chiefly on account of their thinness, but there is no difficulty in making them to any thickness, and the cost compares most favourably with that of work carried out by other processes.

The manner of obtaining a reproduction by this deposit method is by taking a mould either of gutta-percha or other pliable material from the original model. In some instances the mould is made in plaster, which then undergoes a treatment to harden it.

The mould or negative is next coated with a preparation of plumbago or black-lead, and placed in a bath where the metal is deposited into it.

Quite a large work can be made in two pieces only, so that there is but one seam or joint to close when the two pieces are put together. This is by reason of the mould being made of a pliable material, which will stretch, and thus can be pulled away easily from the deposit. Even where there are portions which may be much undercut, the parts come together so beautifully that little difficulty is experienced in hiding the joint when it is soldered together; and this is done in such a way that it is impossible of detection when finished.

I have seen things made by this process which have been regarded as marvellous castings; and but for the closeness of surface, exactness of reproduction, the less clear ring when tapped, and the want of variety of surface patina, they could not be distinguished by the most experienced from castings.

Surely the first thing an artist wants, when desirous of having his work in a permanent material, is a facsimile reproduction of his work, for all other matters are secondary to true form in sculpture or modelling. But I should like to say that, provided you get this by the cast process, then it has qualities which the deposit of pure metal does not, to my mind, afford.

When a plaster mould has been used, it has to be chipped away from the electrotype deposit.

CHAPTER XI

MAKING A MODEL IN CLAY TO BE CARRIED OUT AFTERWARDS IN MARBLE OR OTHER STONE

It is very necessary for the student to make a clay model of his design before attempting the more ambitious work of carving it in marble or stone. It is a costly experiment for the amateur to learn his mistakes on a block of marble. Far better to make a carefully thought out model in clay, and wrestle with all the difficulties of projections, joint lines, &c., in a plastic material, than to start the carving direct from, say, a crude or immature drawing, which can never, even at its best, fully indicate the effect of the heights and projections sought after.

Now, in preparing this model, there are two important factors to be considered (apart from the design). The first is the material in which the carving is to be carried out; the second is the position the executed work is to occupy.

At first sight, a student might question the necessity of worrying about the material until the model is made; but this is a most important point to be borne in mind right from the very beginning. Therefore he should make up his mind whether the work is to be carried out in marble or soft stone, and if in stone, what stone? For these materials

have their practical limitations, and that which is suitable for marble may be quite unsuitable for stone, and *vice versâ*. And again, stones vary so much that a model applicable to a fine stone like Bath stone (Corsham Down for preference) would be utterly impracticable in a harder stone such as Ketton, or Red Mansfield stone.

I feel the importance of this so much, having seen many very interesting models quite wasted by being translated into the wrong material, that for the guidance of the beginner I have thought it best to give here a brief summary of a few of the more popular stones, and to indicate their capabilities :—

Red Mansfield (from Nottingham). A deep roseate-brown sandstone suitable for big architectural work. Will not take fine details.

Clipsham (from Rutland). A dull cream-coloured stone, slightly shelly—useful for architectural and monumental work.

Ketton (from Rutland). Dark cream colour, suitable for monuments.

Hollington (from Staffordshire). A white sandstone.

Beer (from Devonshire). A soft limestone.

Portland (from the Island of Portland, Dorsetshire). Whitish-brown calcareous stone—serviceable for all purposes, very hard and close and will take a clean finish.

Forest of Dean (from Gloucestershire). A sandstone of great durability—wonderful grey-black colour—also red and bluish tones (not recommended for small detail).

Bath Stone (from Wilts and Somersetshire). A pleasant, easy-working stone. Fifty per cent.

easier to work than Portland, but not so durable—will take a very fine finish.

Hopton Wood (from Derbyshire). Hard and of a compact texture, which allows of intricate and delicate mouldings being worked in a very sharp and clean state—takes a splendid polish, and its colours range from a creamy dove-white to a dark dove-grey. It is very durable, and is suitable for memorial or other pedestals and decorative panelling.

Now suppose that the student is going to carve a sundial, say, for his garden; it will require a good firm stone that will weather well, and he could not do better than select a piece of good Portland. Provided it is a sound, clean piece, there is no finer stone for general decorative work outdoors than this.

Let us conclude, then, that the student has made his design and selected his material, and that he is therefore now ready to make the clay model.

If the work to be undertaken is of large proportions, it is best to make, first of all, a little sketch of it in clay, to scale say 1 or 2 inches to the foot. A little model like this is extremely useful, as it shows the design in the round, and if it looks well on the small scale it is more than likely to look well in the full size.

A small sketch of this kind in clay is most helpful in developing the design; but it is necessary to impress here on the student that this little model, to be practical and useful, must be accurately made to scale, and the best scale of all is 1 inch to the foot. Sometimes, if the work is not large, it could be made a quarter of the full size, but you should never be led

into making a half full-size model, a very deceptive scale for even a professional man; the reason being that on this big scale one is apt to model the detail as though it were full size. There is no value in this scale at all, and it is better to model direct to the proper size than to the half size. But for all general purposes there is no more satisfactory method than the 1 inch to the foot.

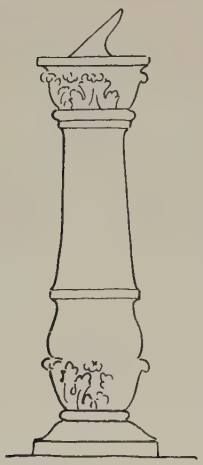


Fig. LXV

PROPOSED MODEL OF SUNDIAL

The student, having satisfied himself that the scale model represents his ideas and design, can then proceed to make a carcass on which to build up the full-size model. It is necessary here to point out the great importance of the model being strongly made, so that there may be no fear of its collapsing or settling down after it has once been started.

If, as was presumed at the start, you have set out to model the pedestal of a sundial, a very good way is to take a good broomstick as the central support, bracket out on this the greatest projections, so as to relieve the weight of plaster—for much of the model can be made direct in plaster, leaving sunk spaces for a clay bed where the ornament occurs. If the student looks at the diagram here reproduced, he will see how it is proposed to turn up the shaft where circular on plan by a very simple and primitive method. Make two bearers to carry the roller, and at one end of the roller fasten an iron handle

for the purpose of turning the roller. Next cut out the sections in zinc, and by applying this zinc strickle to the model as it revolves, you will be enabled to turn up all those parts required, taking care to work the strickle to the true centre line of the shaft.

Being now ready to fill in the ornamental portions of your design with clay, you first give the plaster structure several coats of shellac, to make the clay adhere and to prevent suction.

From this point the success of the model depends

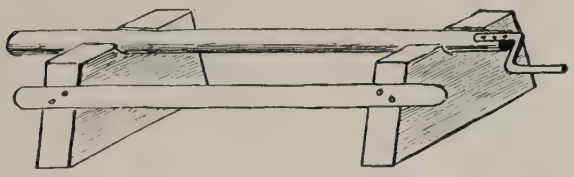


Fig. LXVI

First Stage

Showing elementary method of turning the shaft.

entirely upon the student's own individual expression and interpretation of the design. In all relief work it must be remembered that much depends upon the play of light and shade introduced. The same design may be interpreted in many ways. There are treatments applicable to all phases of work. If the ornament falls on a shaped section, do not spoil the outline by excessive undulations; rather keep the work up to a flat general line representing the architectural outline of the section; and in making a model, always model on a clay ground; do not, for the sake of facility, be led into merely laying your ornament on to a plaster ground. The clay will

probably crack off the plaster, and one cannot get the cohesion, delicacy, and mystery so charming in a clay model, but utterly lost if the modeller is handicapped by a hard background.

So much for the model of the sundial, for the completion of which you have the writer's sincerest good wishes.

Fig. LXVII

SECOND STAGE

Showing the inner core built up roughly with laths.

Now we will proceed to a bigger and more architectural range of work. We will suppose that the student, who has learned the limits of his materials and mastered the elementary nature and demands of simple modelling, now desires to grapple with modelling for some piece of stone carving on a building or monument, a piece of work that is a component part of its adjacent architecture and will probably be placed many feet above the eye.

This demands to be approached from a standpoint quite different to that which we have before described.

In the first place, it must be remembered that the work now is part of, and yet subordinate to, the surrounding architecture. It is a detail that must be discovered; it must not shout and overwhelm the constructional lines of its framework. It must unfold itself to the view slowly, and when it is revealed, it must be satisfactory. There is no excuse for imperfect ornamentation, and nothing is to be condemned more than the ostentatious

display of common and vulgar work on modern buildings.

Let us imagine a musician has written some beautiful music for a song. If the words of that song are not good, the music is wasted. The music was to frame the song, but the poem is imperfect, and both the music and the song are spoiled thereby.

So in architecture and carving, the two are so closely woven in their alliance that it is impossible for either to be perfect unless they both are; and as music is the dominant voice in the song, so must architecture be the predominant partner in the arts, and the decoration, on whatever lines, must be the refining note, never concealing the constructional lines or overpowering its surroundings.

Fig. LXVIII

THIRD STAGE

Showing the outline having been turned up in plaster, and the parts to be modelled shaped to requisite section in clay.

Before beginning a model for stone carving on a building, ascertain carefully the height from the ground of the proposed carving, and incorporate with the model as much as possible of the adjacent mouldings and architecture. Without this, it is impossible to make a model properly, because one cannot judge the necessary projection of the relief, or realise the general weight and balance of the work, without the surrounding architecture. If the work is going to be placed at any height, it is necessary to take

into consideration any projecting cornices or ledges immediately below it, as the line of sight will be affected thereby, for probably from the street level such projecting cornices may cut off from sight some six or eight inches from the bottom of the carving.

Keep the design well up, so that the whole of it may be seen from below. Nothing looks more amateurish than to see the bottom half, say, of a shield cut off by some projecting ledge.

Fig. LXIX

In modelling for stone carving, one of the first things to do is to make sure of the joint lines of the stone work, and to cut these joint lines on the clay model before beginning the work. Bear in mind that the modelling is for stone carving, and the joints are to be considered all the time during the process of modelling. Always study the joint lines so that they cut in a good square place in the ornament; avoid making feather edges, or leaving a thin edge partly on the other side of the joint line—if necessary raise or lower the design, contract or expand it, as the case may be, so that the joint lines cut across suitable places.

When the stone has already been masoned or "boasted" ready for carving, be sure, before starting the model, carefully to check the exact sizes of the stone and the projections of stone left for carving. It is very annoying, after having made a careful model, to find that the stone left for carving is,

say, two inches narrower than the model; so never make a model for stone that has already been worked, without first taking the trouble to measure up the actual stone. And as regards the projections, it is sometimes advisable to make a gauge or gallows set to the extreme projection, with which now and then one can pass over the model and scrape off those parts which are creeping up to a greater projection than the stone.

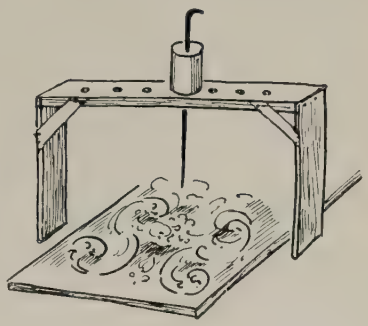


Fig. LXX

A Handy Sort of Gallows

Made with a piece of wire and a cork.

It is necessary to bear in mind that modelling for stone carving is quite different to modelling for bronze work or merely for a plaster cast; for a model that is to be translated into stone has definite limits to its projections, and it is so easy, when modelling, to add on a little more and a little more, till imperceptibly the model begins to grow bolder and bolder, and finally it is found that the model has far exceeded the projection of the stone left for the carving.

Another important point is to get the model right before you cast it. Students are often heard to say that the model has got wrong somewhere, but they will put it right in the plaster or in the carving! Now this is a wrong principle. If one cannot get it right in a plastic material like clay, one is hardly likely to be any more fortunate in a hard material

like stone or marble. So my advice to the student is: "Don't shirk it; get the model right before leaving it, no matter how irksome or tedious the labour may be."

In making a model for marble work, it must be borne in mind that one is now dealing with a costly material; and also at the same time the most beautiful medium for the expression of relief work. The nature of marble warrants a high finish, careful detail, and extreme delicacy and refinement. It is best to consider well these points in the model, and

Fig. LXXI

A Simple Gauge

To limit the projection of the model.

spend more time and thought over the work than for the rougher material of stone; if the student proposes to carve a small panel in marble, the delicacy can be as a thread on the ground, for in marble every line or cut tells. Make the model accordingly: give it play of light and shade in the bold parts, and on the flat ground bring in the delicate undertones, like whispering interludes of a great melody.

Music and ornament have very much in common, and if one thinks of music, whilst modelling, the similarity can be easily recognised. This part ripples along in the tenor; this part gradually grows louder and louder, till like the basso profondo it bursts

forward in full relief; then it dies away softly—softly, till it is almost lost in the ground and it can be just faintly heard floating away into nothing.

Follow this idea out while modelling ornament, and you will be surprised how it helps you to give play to your work.

In concluding this chapter, let me advise the student not to seek to fly before he can walk. To become proficient in carving stone and marble takes years of practice. Do not attempt to carve marble till stone has been well mastered; and do not aim in the early days at too great an elaborateness. There are elementary rules to learn, which can only come with experience. No one can teach modelling or art by book, for that alone can come by intuition and practice. The writer can only point out some of the factors that help and lead to the making of a successful model; but this is merely the beginning of the pupil's career, a signpost that points the way to those who are determined to arrive, not a vehicle to carry the helpless to the goal. It rests with the student to follow up the course from this point where the writer and reader separate; practice, hard work, and determination will carry the ambitious through. Lots of failures, lots of disappointments at first! but let the student console himself—all the greatest sculptors go through these struggles and disappointments in their early days. These are the stepping-stones on which one may "rise to higher things."

CHAPTER XII

MAKING A MODEL IN CLAY TO BE CARRIED OUT IN WOOD FOR ARCHITECTURAL DECORATION, INTERIOR AND EXTERIOR

Making a model for wood-carving is quite different to the other processes described before, although it is closely allied to the process of the stone-carving model, insomuch as both in stone and wood carving the process lies in cutting away, as opposed to the building up that is legitimate in modelling for bronze, terra-cotta, or plaster work. Hence it is advisable for the student to be well equipped with wire tools—tools that cut away the clay, just as gouges cut away the wood.

It is not well that the student should, when making a model which is to be carried out in wood, carve his or her model out of solid clay. By no means do this. Build up the model in the usual way, but in finishing, impart into it some of the crispness of wood-carving by the aid of the wire edge tools.

A model, whether it be for stone, marble, bronze, or wood, should betray its future material by the character of the work you put upon it. A model for a piece of wood-carving should look quite a different work to a model intended for stone-carving; and, again, a model for stone-carving should easily be differentiated from a model intended for bronze. All three have their own characteristics, but, alas!

much faulty work is done in this respect, and one sees but too often wood-carving treated as though it were for bronze or marble, all trace of the material being lost or ignored, when the very charm of this art lies in its material and the gouge cuts which produce it.

Therefore, at the very outset, the student should impress upon his mind that the model which he is about to undertake is for reproduction in wood; and it must have all the characteristics and partake of the very fibre and grain of wood. If that end is kept in view all the time, the craftsman will not go far wrong.

Wood, as most other materials, has its limitations, and these will govern the relief considerably. One is not so much concerned with the joints in wood-carving as in stone-carving, though it is as well to have the wood glued up (when necessary) for the joints to suit the model, so as to avoid working up to a feather edge along the joint.

Supposing the student is desirous of making a model for a carved oak lectern, with an eagle for the book-rest. The eagle would naturally be carved out of a flat piece of oak, say two or three inches thick; and, in making the model of the eagle, it is as well to keep the work flat and slabby. Try to impart the fact that it is created out of a flat slab of wood; do not model so that the eagle's beak and little pieces of the wings have to be glued on, but keep it all flat and cohesive, in keeping with its purpose and material. If it were a model for a brass eagle, the whole thing would be on a different basis, and the modeller would then be untrammelled by any restrictions of relief and projection. But where, as in the case under discussion, the model is

for wood, do not try to model it as though there were no restrictions. Rather is it better to accentuate the fact that the work is to be carved out of a flat plank than to run into exaggerated relief, quite impossible to the material without a lot of gluing and patching up.

Now it is impossible to lay down rules for the student's guidance for all kinds of work. The mere fact that wood-carving perhaps covers a wider field of work than any other craft, embracing as it does furniture and architecture, both domestic and ecclesiastic, with all the accessories of heraldry, botany, allegory, and the hundred and one styles ranging from Celtic, Moorish, Gothic, to the more refined styles of the Greeks and Romans, the lasting triumphs of the Renaissance, and the glorious style of eighteenth-century France and the Empire.

This is part of the range of subjects that a student setting out on a wood-carver's career must make up his mind to know. Hence the difficulty of laying down any hard-and-fast rules to govern such a wide field of work. I would, however, repeat my own maxim, which is an important one: "When making a model for a piece of wood-carving, keep the nature of the material ever before your mind;" for although in some instances it is necessary to ignore the medium and only to consider the ultimate result as a whole, as in carving, say, for a reredos which has to be gilt, yet even then there is no reason why the gouge cuts should not display the craftsmanship of the carver. Let us take the idea, then, of making a model of an altar table. Unless it is to have figure subjects in the panels, it is not necessary to make a complete model; but the model, if it is to serve any useful purpose, must be full size and should contain one

complete angle and return. This is useful in settling the mitres, for no matter how successful the enriched mouldings may be on the straight run, it is when one comes to the mitre that one shows by skilful handling, or otherwise, whether one is a master of the craft or not. It may sound an extreme remark to a casual observer, but it is none the less true, that nothing discloses the amateur more than an ill-considered

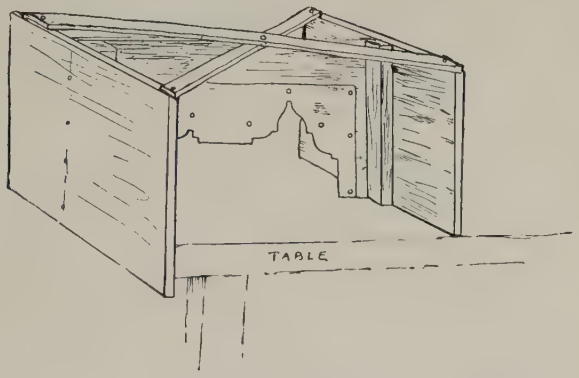


Fig. LXXII

A Zinc Template

For running moulding in either clay or plaster—prospective view.

and weakly designed mitre. A mitre should uphold the contour of the moulding at its intersection. It should be broad in treatment to impart strength and solidity, and it must reflect the idea of the straight run of the design.

When engaged on a model in which mouldings are to be enriched, run all the adjacent mouldings in plaster with a zinc "strickle" (or profile or template). The member that is to be enriched should be worked at the back a full inch deeper (see illustration), so as

to give a thickness and body for the clay, or else the clay will dry up and crack.

If the altar table is to have enriched panels to the front, mostly five, it would do to model, say, two direct on the full-size model. The other three can be modelled on separate boards, as they are easier to handle and to keep moist; and the student will have gained experience and assured the correct scale

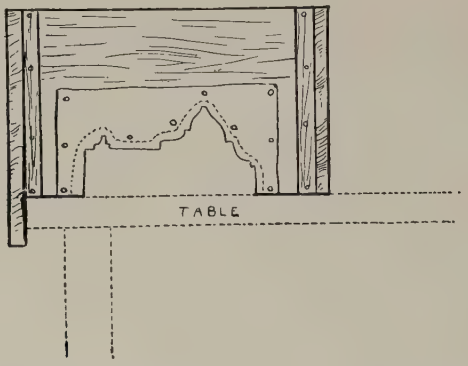


Fig. LXXIII

FRONT ELEVATION OF ZINC TEMPLATE

by the two panels he has already modelled. Be sure and model these panels on a clay ground of three-quarter thickness at least, for by this is gained greater delicacy and better work. It is practically impossible to make a satisfactory model by working direct on to a wooden ground. You must always set back the ground of the model, so that there is at least three-quarters of an inch of clay to form the background of the work.

There must always be sympathy and a feeling of clinging of the ornament to its background. Do not

isolate the design so that it stands apart from its surroundings; rather let it fall into its place subservient to the construction which holds it.

In modelling for heraldic wood-carving, always entirely fill the panel up to the square edge; keep the shield small, the crest big; the ragged banner can spread to any dimensions, for the ragged banner is but a torn flag rolled round the helmet and falling away at the back of the supporters. The supporters must have one front limb touching the shield. It is heraldically incorrect for the supporters to turn their backs to the centre shield; they must face towards the centre and by some means grasp or support the shield.

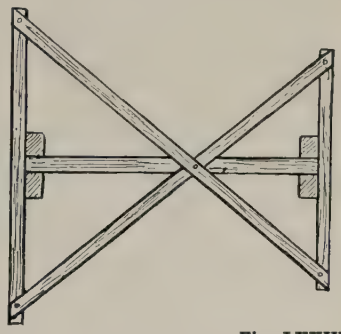


Fig. LXXIV

PLAN OF WOODEN FRAMEWORK UPON WHICH THE ZINC TEMPLATE IS FIXED AND WORKED

In modelling animals for heraldry, you must not make them too natural. The essential features of the animal must be exaggerated—for instance, if the subject is a lion, the limbs must be massive, denoting strength, the body starved, the brow receding, the head small; for in heraldry the lion denotes strength—strength of limb. Above all, avoid the sleek, overfed kind of pet cat so often put forward as a heraldic lion. All the animals used in heraldry denote by their modelling the natures of which they are the symbols.

The knowledge of botany required in modelling is not great, but it is a very useful training and

acquisition to have a knowledge of leaves, flowers, fruits, and their characteristics. Those most usually required are the oak, laurel, chestnut, acanthus, rose, chrysanthemum, and palm. It is most desirable that students should equip themselves with careful studies of these plants, which they will find invaluable all their lives for reference,

In making a model for carving on furniture, we are dealing with smaller details than is often necessary on the larger scale of architectural work. Much of the treatment of the work will depend upon the wood and its colour. For instance, in mahogany, darkened and polished, the nature of the material blurs much of the effect which would have been obtained if the wood had been left raw. There is perhaps no wood which repays carving and lends itself to every delicacy so much as a beautiful piece of oak left in the raw state: every cut tells, every line catches the light, and all the mastery of the craft comes out when oak is skilfully worked. So, when there is a doubt, give the preference to oak and leave it in its raw state. Many people object to oak because in its raw state it catches the dirt. It may do so at first, perhaps—so much the better! In time it will partake of a beautiful tone of darkening colour.

It is always as well to make a full-size model in deal of at least part of the piece of furniture intended to be made, before proceeding with its construction in the harder woods, whether it be the back of a chair, the leg of a small table, the angle of a cabinet, or the section of a cornice to a bookcase which it is intended to enrich. No matter how carefully it has all been set out on paper, one can hardly realise the true effect of it in its proper relief till

it is seen as a full-size model; and on studying the model the student must perforce find many points which can be considerably improved upon, now it is produced in relief, and which, had it been begun direct in the hard wood, might have been impossible to alter, and therefore objectionable to the possessor all his life. And all this just for the sake of saving a little extra trouble in making a model at first!

Little can be said in a book of this class as to the styles in which to model. Style is perhaps a question of temperament. No one style is pre-eminent in everything; certain styles lend themselves better to one class of decoration than another. For instance, I doubt if there are many examples of a Gothic ball-room; it would not seem natural. Yet there is no reason why a Gothic ball-room should not be carried out. But at the same time there is a mute language in all styles, a language that is begotten of the environment of the lives that are inseparably interwoven with these styles.

The history of France speaks to us to-day with no uncertain voice in the architecture of her great palaces and châteaux. It is so apparent that, even if one had never read her history in books, her architecture would portray her character and former glories as no word-picture ever could.

Spain, again, has her distinctive characteristics written in the flamboyant but beautiful character of her work, while England, more cold and reserved, remains still conservative and faithful to the traditional styles of her land. The United States to-day is writing her history in polyglot styles in which commerce flaunts from the huge sky-scrapers to the world. How different to the States of South America, where Spain again has enriched the world

with old and richly-gilt carvings in thousands of wonderful churches planted there in the days of her zenith.

All this leads back to what was said at first as to Style being but the expression of temperament; but, observe, it is imperative that the student should not ignore Style. It is not to be believed that the creative powers of a student are superior to those displayed in the lessons of the past. Knowledge of styles is absolutely indispensable. It is impossible for a student to create a new style or period. And it is only possible for an artist to depart from traditional work when he has mastered the schools of design that have become historical. It is, unfortunately, considered by a certain class of students that they can ride supreme on their own creative faculties. Perhaps to some extent they are successful in their early efforts, which is more the pity; but you may rest assured that without the backbone of traditional style no work can live. Eccentricity must not be confounded with genius, nor must dignity be sacrified to originality.

Do not imagine that it is necessary slavishly to copy existing styles, but it is vastly important that a student's art education and all his early work should be built on sound lines, which will save him from the pitfalls of that elusive chimera "a new style." It may be added that the only men who have ever achieved success in creating original work are men who have been through the mill of hard work, and by their experience and knowledge of traditional styles have been able to impart a greater originality and freshness to their work out of that very knowledge.

CHAPTER XIII

COLOURING, WAXING, AND BRONZING PLASTER CASTS

A DRY plaster cast, unless coated with some preparation, is not an agreeable material to look upon, and does not give you the quality of surface that your clay model does. It is not only opaque but dead in appearance; so much so that Canova truly described clay as the life, plaster as the death, and marble as the resurrection. But as we cannot always afford to put our work into the final material of either marble or bronze, we devise a method of imitation by which we can obtain a very close resemblance to the qualities of real bronze, and something like the effect of old marble—an ivory-like character; indeed, it is quite possible to get many interesting effects on plaster, all better than the raw material.

The first and quickest, the least costly, and the simplest means of doing away with the opaqueness of plaster is this:—

When your plaster cast is dry, and you have removed all dust from it, give it two or three coatings of white French polish, letting each subsequent coat be applied only when the previous one has dried in well. A matter of half-an-hour will suffice. It may be that with only two, or even one, the effect will please you, in which case a further application is not required. This will be a matter of taste with the

operator, but I would remind you that the more times within reason you cover it with this medium, the higher the polish will be. After the second coating the surface of your plaster is closed, and any more put on forms a skin and tends to fill up the detail.

When applying the medium, do not let your brush be too full of the liquid; more especially does this refer to all coatings after the first.

French polish, being nothing more than shellac dissolved in methylated spirit, can be quite easily made by any one, and at less expense than if bought ready made up. Besides, you can make it to your own liking as regards strength, though the polish you buy prepared for use can be thinned, if necessary, by the addition of methylated spirit.

When you have given your plaster as many paintings of the polish as you wish, and the surface is thoroughly dry and hard, you may further improve the effect of your work, if you wish to strengthen the detail or darken the hollows, by taking some methylated spirit in a saucer and adding to it a little dry powdered colouring matter such as chrome yellow, yellow ochre, raw umber, or light red, these being the colours generally recommended for the purpose. This solution should be painted on, wherever you think it necessary, with a camel-hair or other soft brush, such as you would use for water-colours.

If the colour should run over other parts than those intended, there is no need for alarm, as it can be removed quite easily with a little cotton-wool or soft cloth. Should it, however, be inclined to resist, take a little of the spirit in the wool and quickly drag over the parts; any sign of the colour will thus be instantly removed.

There is another method of applying this colour and spirit. Quite a good effect can be obtained by taking a large soft brush full of the colour and going quickly all over the plaster work, beginning from the top. When this has become dry, which is usually a matter of a few minutes only, wipe the wool over such parts as you wish freed from the colour, which will almost dust off, unless you have in the application rubbed too long the surface of the plaster, and thus dissolved the shellac coating, in which case the shellac, being a fixative, will hold the colour, and only cotton-wool or soft cloth dipped in methylated spirit and rubbed on the parts, will remove it.

It is advisable that any colouring matter which you may wish to put on plaster should at first be applied in quite a thin solution, for it is easier to darken by another painting than to lighten in tone by the removal of some over-colouring.

If it is desired that the colouring shall adhere more firmly to the plaster surface, a few drops of the French polish added to the spirits in your saucer will hold it permanently.

To obtain any extra polish on the surface, take some French chalk in its powder form, and with a pad of cotton-wool apply it by rubbing quickly, though softly, over the surface of your work, or over such parts as you may wish to have a higher polish.

When it is your purpose to colour your plaster model, keep it as clean as possible, covered and protected from dust, no matter which method you may use, or to what extent you may be applying the colour. Dirt or dust on a raw plaster surface is horrid, and cannot easily be got rid of; but the same dirt or dust on a plaster surface which has under-

gone the treatment of which I have here spoken, has sometimes an agreeable effect and quality, and is almost too readily removable. I say this because I have experienced at times the vexation of finding that the industrious maid has dusted away quite a nice effect which I had seen the night before on a work.

Dust in the hollows of some plaster works, as in the hollows of some works in bronze, has quite a fine and valuable effect; though the opposite result will ensue when it settles on the top or front surfaces.

Another method of toning down plaster from its crude whiteness, and dreadful opaqueness, to an agreeable quality of surface and general appearance, is that of *Waxing.*

For the process of waxing plaster, it is more especially important that your model be kept very clean, even more so than if treated with the French polish; indeed, the greatest care should be taken from the time of beginning to cast a work which you propose afterwards waxing, to see that your plaster in its powder state has no dirt in it; that it is free from dust, as the room should be where you make your casting; and further, when your cast is made it should be wrapped up carefully in tissue or other soft paper, and put away to dry thoroughly.

All this is necessary if you wish to obtain a perfect result from waxing. When such precautions have been taken, the subsequent experiments of toning down, colouring, or discolouring can be made quite easily, and the waxed surface will admit of this to any extent.

If, however, you wish to apply wax to a plaster cast which has become soiled, or one upon which you may have worked in its plaster state, it is still possible

that a good effect can be obtained, and the work made to look quite agreeable as compared with the dry, unwaxed plaster surface.

The way to treat a cast in this soiled state is quite simple. In the first place, it is necessary that your cast should be dry, or nearly so, for this allows a better absorption of the wax. It is also helpful in the same direction if your plaster model is made warm by placing it by a fire, though great care should be taken to prevent its getting burnt or scorched; to avoid this, and to get it equally warm all round, which it is advisable to do, turn it often, it may be every few minutes if the heat thrown out from the fire is great.

Before or during the warming process, you prepare your wax in the following way, using only, when possible, the best stearine wax for the purpose. It can be obtained from a Dental Supply Stores, as it is the same as that used by dentists for waxing the cast taken of the mouth of their patients for fitting them with new teeth.

Take a piece of the wax the size of a walnut, cut it up into thin wafers, and dissolve it on the fire or gas stove in a tin or enamel saucepan. This will take but a moment or two. Then remove it right away from the fire and add to it half a pint of turpentine. It must be remembered that, turpentine being of a nature so inflammable that it is highly dangerous if brought into contact with fire or lighted gas or matches, great care should be exercised. It is important to bear this in mind, because when you have added the turpentine to the wax it is advisable to warm both a little to ensure their being properly amalgamated. In this case it is safer to put the wax and turpentine into a gallipot, and this

gallipot into a saucepan sufficiently large to leave a space of water between it and the inner vessel. Warm this on the side of a fire without much flame; or if a gas ring or jet be used, let the gas be turned low, as but little warming is required, and hurry must at all cost be avoided when there is risk in the process.

Do not let your attention be diverted until such time as you have removed the saucepan from near the fire or gas, or it may boil or spit up in your absence and get alight. With care there is no need of fear, but I must insist on cautioning the student, lest he be careless or merely ignorant of the danger.

With your wax and turpentine prepared, and your work on the turn-table, you may at once apply the liquid with a clean, good-size hog-hair brush, beginning at the top, proceeding all round, and working downwards to the base. This application you may repeat several times.

It will, it is quite likely, be found that in parts the wax remains thick on the surface, if the work has become cold; but it will be absorbed by the plaster, if the bust is placed near the fire and made warm again.

When your work is lifted back on to the turn-table, a further painting of the wax may be put on, though in this case with much less wax in your brush than you had previously.

It may be found that the wax, as it cools in the vessel, will set into a paste-like consistency, and may need the addition of more turpentine, and again heating, but not if it only resembles a thick liquid. Warming thins it, and it will therefore more speedily soak into the plaster.

For darkening the hollows and crevices of the

detail you should take a little powder colour of any tint you wish, as in the case of the work which has been coated with the white French polish; but in the case of the waxed plaster, use the wax and turpentine medium instead of the spirit, to mix with the colour. Paint this on your work; you may do so freely, for a little cotton-wool will wipe it off parts where it is not needed, if that be done within a reasonable time afterwards, and before it has been allowed to become fixed. Even in such a case a little turpentine on wool and soft rubbing will remove it.

When you have done as much tinting or darkening as you think desirable, and the wax has thoroughly dried in, you may improve the appearance of the surface (as in the case already mentioned where French polish only had been applied to the plaster) by rubbing over the whole work or parts only, according to discretion, with cotton-wool and French powdered chalk, applied with a quick though soft circular movement. By this means you can obtain almost any degree of polish. Under no conditions rub hard on the surface, but let your pad of wool pass lightly over the work.

A work prepared in the wax manner can afterwards be painted upon to almost any extent, with powder or pastel colour, and the turpentine and wax for a medium; or the dry colour itself will adhere in some degree if rubbed on with the finger.

The two methods I have described for plaster casts are particularly useful in cases where the work is of large proportions; but in the case of a small work, such as a medal, statuette, panel, or miniature bust, of say not more than half life-size proportions, the following method of stearining it produces a very ivory and old marble-like appearance.

Place your model when quite dry in an oven of fairly warm temperature, or if you have not this convenience, by or above a fire, not so near as to burn it, but close enough to heat it quietly through the plaster and well below the surface; turn it frequently, so that all its sides may get equally warm, protecting it all the time from dust.

In the meantime prepare your wax and turpentine in the same proportion (and with no less caution against its catching fire), except that it may be made a little hotter in this instance; indeed, it is better to get it up to something approaching boiling heat if this can be done with all safety, for the reason that when applied it will remain in its liquid state much longer than if at a lower temperature, and it will get absorbed further below the surface.

You must not forget to turn your work frequently during the time you are preparing your medium, so that both this and the medium are well heated at one and the same moment.

The medium being now in its prepared state, place it where its temperature will not decrease quickly, but away from the possibility of its getting ignited. Then take your work and place it in a china or enamel bowl of sufficient size, and without any further delay pour the wax and turpentine mixture all over it, using at the same time a clean hog-hair brush, or what is commonly called a house-painter's pencil, with some of the liquid in it to get into the crevices.

Your plaster will have become quite hot by this time, so that the wax now in the bowl can be poured back into its receptacle, the work replaced in the bowl, and once more the liquid poured and brushed over it. This proceeding can be repeated a number of

times if it is desired to get more wax into the body of the work.

If the wax after a few pourings becomes "set," *i.e.* pasty in consistency, it may be warmed up to a liquid state and poured over again. If you have to re-warm, take care that the sides of your vessel are clean, and free from any of the wax which may have run over in the process of pouring, unless the vessel which you are using goes into a larger one with water in it, as previously advised. In that case the great danger of ignition is lessened.

When your work has had sufficient coating of the wax, remove it from the bowl and allow it to cool quietly; otherwise it may crack and have a *craquelé*[1] (crazed) appearance all over it, as you sometimes see in a piece of earthenware.

If the work is of such small proportions as to have been entirely covered with the liquid, you should let it cool afterwards very gradually indeed, which can be done by wrapping it up in a piece of blanket or cotton-wool.

When it has cooled down, or during the process of cooling (if it is not wrapped up in the manner I have spoken of), you may use the pad of wool with French chalk, and rub over the surface; then you will see almost immediately what a beautiful quality the plaster has obtained by this method of stearining; and as time goes on it will improve, more especially with an occasional passing over with the cotton-wool.

At any future time a little colouring matter, such as I have mentioned, mixed with turpentine, may be run into the hollows.

[1] This is a term used in the Potteries to describe a piece of china the surface glaze of which has cracked all over minutely.

Some of the most beautiful results of colour I have ever obtained in plaster have resulted from mixing the colour with the plaster before casting; this method is well worth trying, rather in the casting of replicas than with the first or original cast, which is better white, as you may wish to work upon it. For any colouring matter in plaster makes it less easy to get the effect you may desire, either by cutting away, because the colour may be, and generally is, a little different below the surface; or by adding to it, because the plaster you put on is more than likely to be of a different colour, and so your work becomes patchy and disagreeable in appearance. Therefore try this method with replicas. You may do so in various colours, in the following way.

Mix on a palette or plate, with water, some powder colour, working it into a paste with a palette knife or ordinary knife, until it feels quite smooth and free from grit; then pass it through fine muslin into a basin, thinning it with water so that it will run through the mesh; you may then add more water to it. Always mix enough of this colouring matter at first; the cost is insignificant, and a little waste is of no consideration, compared with that of failure to get an even colouring for want of more colour.

The coloured water you now have in the basin is used for putting in the larger basin with the clear water which you will require to mix with your plaster for making the cast. When you have added the colour-solution to the clear water, stir it up very thoroughly, and then keep it moving slowly to prevent any of the colour sinking to the bottom while you sift your plaster in; when you have put in enough plaster, and it is ready for stirring up, do so quickly and well, particularly stirring or

"beating" it up at the bottom. Remove the scum from the top, and pour the plaster into your mould (which you must shake), and force it in its liquid state to run well into the hollows and to prevent the formation of air-bubbles.

A cast made of coloured plaster should not be worked upon after it has come out of the mould, if this can be avoided, because, as I have already mentioned, any working upon the surface changes its colour in that particular part.

If it is necessary to work upon it, the whole work should be passed over with a piece of soft flannel, not to change the form or take out any detail, but to bring the tone better together.

When no working upon it is required, it is better to wrap the cast up carefully in soft paper, so that the dust cannot get through to it. When it is quite dry it can be treated with the wax in either of the ways described, and afterwards rubbed over with French chalk on cotton-wool; and if you have chosen a good colour, the result will be splendid. I should point out that there is a tendency to put too little colour into the plaster water. The depth of tone of your plaster cast when first it comes out of the mould will be the same as when it is waxed, though the intermediate stage, that of drying, lightens it in appearance.

With plaster casts that have become very soiled, and almost beyond cleaning, two, three, or a dozen coatings of boiled oil, which can be purchased from any oil and colour shop, will serve best for making them presentable. These coatings will preserve them from any further dirt getting into the body; and such as may fall on the surface can be removed with a damp sponge, and afterwards wiped dry with a cloth.

A plaster surface which has been treated with boiled oil will gradually darken, and in time will become one equal colour all over, and possess a rich mellow quality. I do not advise this treatment of oiling except where the cast is old and soiled, because of the change I have spoken of coming about, which renders any tinting, colouring, or darkening of the hollows, or other parts which you may wish to accentuate, valueless in time.

Before proceeding to speak on the subject of bronzing, I think it well to describe a simple means of cleaning a plaster work which has become discoloured with dust or soiled by the fingers from handling, to make it as clean and white as when it first comes out of the mould.

Place your cast in a bath or other receptacle, deep and wide enough to leave space between it and the top, so that it will be completely under water when the bath is filled. Your cast need not remain upright, but may be laid down. Having tried your work in the dry bath and determined the way in which it shall stand or lie so as to assure its being covered with water, remove the cast and fill the bath with sufficient water to serve the purpose; then, having well dusted your cast, immerse it and leave it for the night, or twelve hours; by this time it will be soaked through, when it should be lifted out of the bath.

If some of the dirt is found to have remained, it can be removed quite easily by placing the work entirely or partly back into the bath, and then wiping it over with a large camel-hair or other soft brush, or sponge full of water. This should completely restore the cast to its original white state. Never attempt this process unless you have a bath suffi-

ciently deep to hold enough water to cover your plaster model completely when it is put inside, or your work will be spoilt. If the student desires to know the spoilt effect, he had best make the experiment; it will save me writing of things which are not worth knowing.

A plaster cast which has had a bath, can, when the moisture has dried out of it, be treated in any of the ways I have described—painted either with French polish, wax, or the boiled oil, with the same result as if it had never been under water.

The methods of bronzing are as numerous as they are uncertain in result. I know of no method by which you can be more sure of getting the effect you desire than the following simple one.

Give your plaster cast, when free from moisture, one coating of French polish; either white or brown may be used in this case. Apply it with hog-hair brushes, and do not forget to paint the hollows. Let the work stand for half-an-hour, or for such time as may allow the polish to dry in. Wash your brushes in the meantime in methylated spirit; otherwise they will dry stiff and soon become useless.

You must have provided yourself with some bronze powder. This can be purchased at any good oil and colour shop at about a shilling an ounce for the best quality, which quality I advise you always to use, in preference to inferior and cheaper stuff. It is well to have by you also some copper powder, in case you wish to add a little to your bronze powder, in order to get a warmer and more coppery effect.

The next process is to paint your plaster cast with this bronze powder. This is done in the following way. Pour a little white French polish into a saucer, and thin it slightly with a little methylated

spirit; then add to it a little of the bronze powder, and, if you desire, a very little of the copper powder too; mix them together with a brush (a hog-hair), and begin by painting in the hollows and deep crevices first, doing so rather by dabbing it in than drawing it across, and have very little of the colour in your brush at any time. Stir it up each time upon taking more, as the powder, being heavy, sinks very quickly to the bottom of the saucer; avoid putting it on thick or it will form a skin and fill up some of your detail. When you have painted into the hollows, do the same over the front surfaces. There is no reason to be alarmed if the surface of the plaster does not get very well covered at first, because a second painting with the powder, put on in exactly the same way as before, will do everything in the way of hiding all signs of the white plaster. It should be remembered that this second application must not be put on until the first is quite dry and hard, and to get it to this consistency it is advisable to leave it to stand for nearly an hour. And leave it for a similar time after it has been painted a second time with the powder.

At all times when using this powder it is advisable to mix only a little at a time; if too much is mixed in the saucer, the spirit evaporates and the French polish begins to thicken and dry before you have nearly covered your plaster.

Your work after the second coating of bronze powder presents a very disappointing effect, looking like an advertisement for some one's gold or bronze powder; but this is only one of the stages of bronzing, the next stage being to hide this glittering, cheap appearance, and to get a resemblance to real bronze.

Bronze varies so considerably in colour, through

various climatic effects and other reasons, that in imitating it you select a colour which you think will best suit. It may be a light or dark brown, a purple or a black, or almost any shade of green, or it may even be a bronze with some little of all these colours in it. This last-mentioned effect can be obtained with care, though it is better to try a simple colouring or imitation, until such time as you may have made some experiments, and gained some knowledge of the possibilities of the materials with which you have to work, and of the effects to be obtained.

Therefore we will suppose that you desire to make your model of a light-brown bronze. The colouring matter you will require will be raw umber, of which in its powder state enough can be purchased for a penny or two to cover nearly a dozen casts.

Fill a saucer three parts with methylated spirits, and add to this about three tea-spoonfuls or less of French polish, either white or brown; then put into this about two or three teaspoonfuls of the raw umber, and stir it up well with a large camel-hair brush of about one inch in diameter. When it is dry, paint your work with this, beginning always from the top, and covering it as far as possible all round. This should be done with a fair quantity in your brush each time you apply it, and quickly, so that each brushful you put on shall take up and mix with the last one put on before it becomes dry. Continue this until you have got down to the base and all the parts are covered.

There is no need for alarm if this colour, as you apply it, runs down in parts a little. Therefore do not attempt to brush it up or flat; it is better to leave it until you pass over it in your progress downwards.

When the whole work is covered, it should be left to dry. Ten or fifteen minutes will suffice; then, if it is not thought to be dark enough, another painting can be given in exactly the same manner.

I must repeat that it is important to stir the colour up with the brush each time a fresh brushful is being taken; otherwise the colour will sink to the bottom, and the coating which you put on the work will be patchy when dry.

When you can judge it, it is better to mix your colouring to the thickness and tone that will only require one painting, as a second application at this period sometimes removes the first coat or wash, unless the new work is done very quickly and skilfully.

The next process after the colour is dry is to wax the work all over. Wax and turpentine are mixed together in the same way and in the same quantities as for use on a white plaster cast, and as already directed, though in this case the cast must not be warmed. Then leave it for a night until the wax has thoroughly dried in.

It has then reached a stage when any further effects can be tried with less fear of trouble ensuing, as you have a fairly hard bronze body to work upon. If the work please in its present stage, then brushing with a quick movement with a fairly hard clothes-brush or clean boot-brush over the surface will add to its appearance. The friction of quick brushing not only gives some burnish or polish, but has the effect of changing the colour of parts satisfactorily. It should be understood that though the brushing should be with quick action, little pressure should be put on the brush, the bristles only being allowed just to touch the surface of the work.

Should, however, the colour not be satisfactory, apply a further coating or painting of colour, mixed and put on in the same way as before, with methylated spirit, though in this case with even less of the French polish than was used before with the application of colour; and when this has dried, brush it in the manner already explained.

It may be mentioned that green, or any other colour (or it may be lampblack, which, used sparingly, produces a good effect), can if desired be used for this second coating. Then in the brushing process, this colour which has been used for the second coating (*i.e.* after the waxing) will remain in the hollows untouched and unpolished, and will therefore give a contrast to the quality on the surface which has been brushed.

If it is now felt desirable to get a greater variety of colour in your work, this can be effected to any extent by wiping dry dust colour on to it with your finger or a little cotton-wool; this colour will adhere quite well in the hollows, where the wax, not having been brushed, will "hold" it.

If you wish to get a variety of colour on the projecting parts, or any parts besides the hollows, it would be best to apply the dry powder colours on the wax surface before brushing it. Pastel colours are excellent ones to use, though they are more expensive than the ordinary powder colours you purchase at the oil and colour shop.

If, when putting on a dry powder or pastel colour, you wish to get, we will suppose, a purple tint, it is better to do this by first putting on the blue and then the red on the top, or *vice versâ*, rather than by mixing the two colours together and then applying, for the reason that a better and truer metallic effect

is obtained by the two being put on separately. The same method is advisable in every case where dry powder colour is used, and where it requires two colours to produce the tint desired.

Sometimes the ordinary dust from a shelf, thrown into the hollows of a bronze work, has a special value.

Another method of colouring the work when it has its bronze powder surface prepared is to use as a medium a little gold size and turpentine for mixing your colour with, and for making into a liquid state. This should be in the proportion of $\frac{1}{10}$ gold size, $\frac{1}{4}$ colour, to the turpentine. By this means you are more certain of getting uniformity, because this medium dries more slowly than spirit and shellac, and is therefore capable of being manipulated more freely. Moreover, it allows you more time to apply it, which is of importance to the beginner, who has had perhaps no previous practice in bronzing. But it is well to remind the student that the method previously spoken of has its advantages.

Oil colour, such as an artist uses, can also be painted on to a work which has been coated with the bronze powder, but it should be put on only when made thin with turpentine as a medium. It should indeed be used more as a wash, in the manner of water-colour painting, rather than oil; otherwise it will form a thickness and will fill in much of the detail. If oil colour is used it should be done very sparingly at first, for it can always be made stronger, if required, by a second and even a third painting, either all over or only in parts.

There is yet another method—indeed, I may say there are several others—of bronzing; but I propose to deal with one more only, feeling, as I do, that

those I have mentioned are the best and simplest for the student to attempt.

First give the work in plaster a coating of boiled oil, and when this has dried in fairly well, give it a good coating of terebene, and leave it until dry; then take some of the powder of such a colour as you wish the whole surface to be, and mix with shellac (either white or brown) in a saucer or other vessel. This, when painted, will form, so to speak, the body upon which to put the further and final colour or colours, though these final colours should be mixed with water only and put on more in a wash. If found patchy when dried in, the colour can easily be distributed equally by means of a brush with the water nearly all squeezed out, and with a dabbing, rather than a wiping or washing action, going over the patchy parts, spreading or extending the colour picked up in the process from one part to another. By this means you will get the colour to "hold together."

You may "work in" either colour or bronze or gold at the time of this dabbing, but it should be in small quantities only, and applied by taking a little on the moistened brush.

The bronzing produced by this process will be dry in its effect as an antique bronze which has been exposed to the air. Should it, however, be desired to get a polish upon it, this can be easily obtained by waxing in the way I have already described, by painting over with the mixture of wax and turpentine, though it will change the appearance by darkening it very considerably, and will indeed take out much of the colour. For this reason I do not consider this the best method of bronzing, unless it be to imitate a "dead" or dull surface.

For work of heroic or large size it is a quick, and relatively cheap, means of getting a bronze-like result.

Bronzed works (which means in this case plaster bronzed) are easily chipped or scratched, in which case the white plaster becomes visible, and a touching up is necessary. Not always is it easy to touch these parts up satisfactorily, nor is it convenient; as, for instance, when the work, having found a purchaser, has left your studio. I should therefore like to mention, before closing this chapter on Bronzing, that you may get over the difficulty—or, I should say, lessen to some extent the unpleasant white plaster effect of a chipped or scratched bronzed work—if you treat your work in the very first instance, *i.e.* before you put on the first coating of shellac, with a painting all over of black ink, or a dark water stain, or Condy's fluid and ink mixed; any of these will soak well in and beneath the surface, and in the event of subsequent chips or scratches, they will be less discernible, and your work will suffer less in its appearance than it would if the body under the colouring were white.

CHAPTER XIV

ENLARGING A SMALL MODEL TO HEROIC SIZE BY THE CHASSIS

THE method generally adopted for enlarging a figure or group in the round is by working with a chassis, as here described. We will suppose that you have made a small model, say 2 feet high, for a public statue, and that this has to be enlarged to 12 feet, or six times its size.

You begin by fixing the small model firmly on a pedestal or modelling stand, the top of which must be nailed down to prevent its revolving. Then it should be accurately adjusted with a spirit-level on the top. The stand must also be nailed or screwed (or the legs of the stand plastered round) to the floor of your studio, conveniently near to where you propose building your large model. For the latter you will require a very strong turn-table or "banker" with a revolving top, but this, as with the small pedestal, will require also to be fixed, so that it will not revolve until such time as it is deemed necessary, as will be seen later on.

The next step is to make your chassis for the small model. This is a square frame made of wood, slightly larger than the greatest width in your small model. Upon the four sides of this frame you mark off very accurately the inches, $\frac{1}{2}$ inches, $\frac{1}{4}$ inches, $\frac{1}{8}$ inches, and $\frac{1}{16}$ inches, so that, if your frame were 12 inches square, you would set out a 1-foot rule at each side

of your square (see Fig. 75). It is most important that you should have your frame made very true, and that all the measurements, inches and parts of an inch, be most accurately set out, and with the different lengths of lines ruled through in the same way as you find in a well-made foot-rule. V-shaped notches should be cut out on the top edge of the frame with a sharp knife at all the inches and half-inches and fractions.

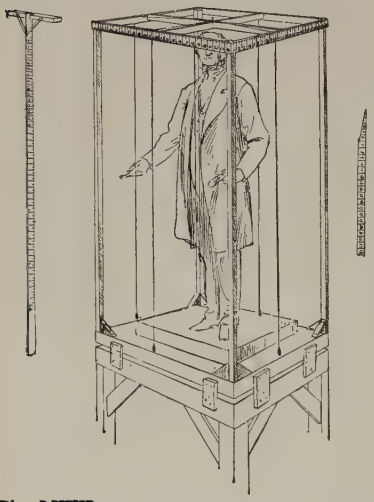
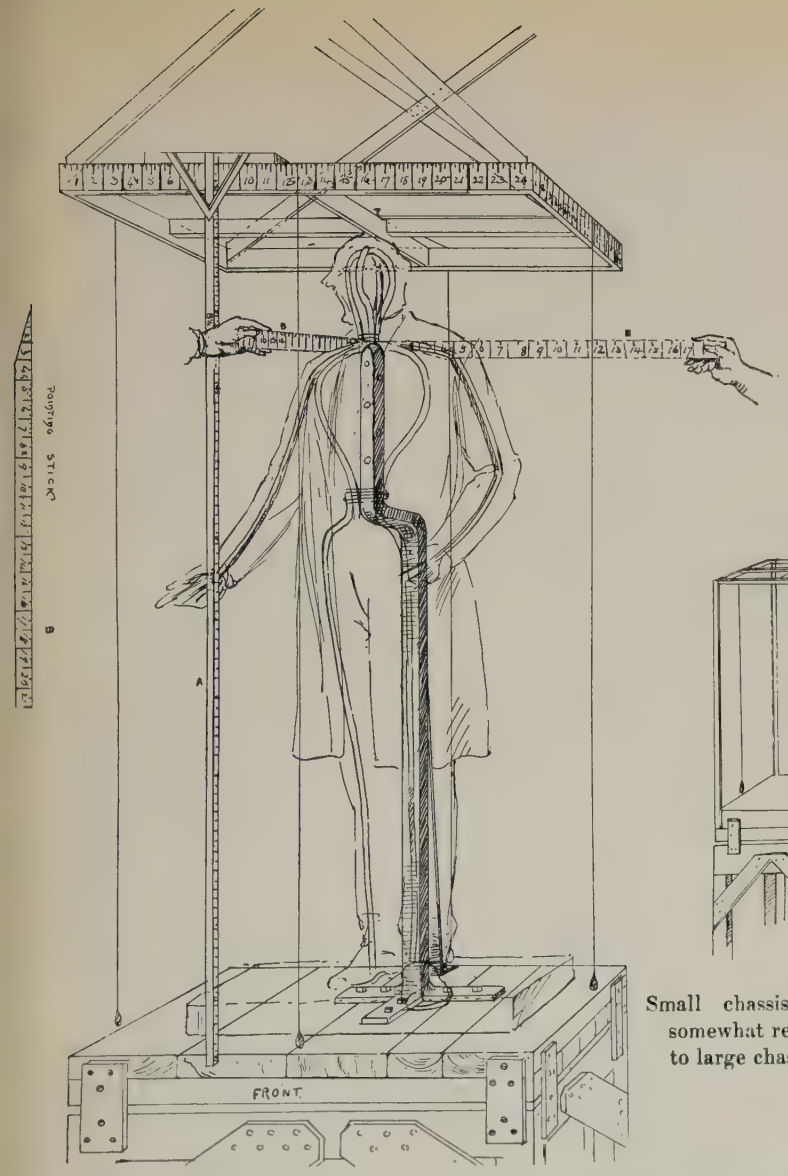


Fig. LXXV

THE SMALL CHASSIS PLACED OVER STATUETTE

With perpendicular rule for "distance down" measurements, and pointing stick for "distance in" measurements.

With this done you will start to mark out on a large chassis (which you will have already had made by your carpenter to the scale of six times the small one) the twelve inches and parts of an inch, and as your large model has to be made six times the size of your small model, it will be seen that an inch on the large frame must actually measure six inches to be correct in scale, and so the other portions of the inch become enlarged to this scale. V-shaped notches should be cut out on the top edge in the same way as on the smaller frame, at the points (inches and fractions) where the lines are drawn through.



Small chassis to show somewhat relative size to large chassis.

Fig. LXXVI

Large Chassis with Hanging Rule and Pointing Stick

It will be seen a point is being taken to show where the point in the pit of the neck will be fixed.

You now have your two frames ready set out. To fix them up is the next thing. The smaller one is placed over the plaster model and supported by an upright post at each corner, these posts being firmly screwed down to the pedestal, care being taken that they are accurately vertical (or perpendicular) and that the chassis is perfectly horizontal on the top. Use a spirit level to get this true. Your small model is now, so to speak, inside a cage at all points. You will next proceed to fix up your larger chassis. This, instead of being supported by upright posts at the corners of the pedestal, should where possible be suspended directly above your large "banker," from the beams, walls, or roof, in such a way that it is quite safe and will not move. This chassis must be fixed proportionately high, according to the scale to which you are working—in this case six times as high as the small one—above the large banker or turn-table; the height should never be less, but rather greater. This will not affect the size of your figure, by reason of the whole of the measurements being "dropped" or taken down from the chassis, but will give you an opportunity, should you wish, of making the base or groundwork of the figure deeper. This extra depth is often required, so that a good safe plan is to allow for it, unless you have made a good extra depth of base in your small model.

You have now, we will suppose, your two chassis fixed up, and you will observe from Figs. 75 and 76 that a nail or screw is placed in the centre of each, *i.e.* where the two struts of wood cross inside the square, both in the small and in the large chassis, which serve to strengthen the framework and prevent it from buckling. This screw or nail is not driven

entirely home, but a portion of it is left standing up away from the wood. Tied to this are four pieces of string, one for each side of the square, long enough to reach over the top and drop down to within a few inches of the level of the banker or pedestal. A lead weight is attached to the end of each piece of string, which thus serves as a plumb-line. These plumb-lines are lifted over to any of the V-shaped notches, indicating inches or parts of inches, on the small model. Similarly, the plumb-lines of the larger chassis can be lifted by means of a long piece of wood or stick on to their corresponding number. The piece of wood which you will use for this purpose should be made perfectly straight, and long enough to reach from the top of the chassis to just below the level of the banker, and it should have a T-piece which will allow it to hang on the top of the chassis. Down at each side of this long piece of wood the inches and parts of inches are set out to scale, beginning from the top. A smaller stick, also with a T-piece and with the actual inches, half-inches, and so on, set out, is necessary for use in connection with the small model.

You now have the plumb-lines, which you can place over the notch of any number you may wish on the chassis, and you have the vertically hanging rule or stick by which you can measure any distance down from the top of the chassis. Nothing remains to be made before you proceed to "point up," but the two pointing-sticks. These consist of pieces of wood carefully made, one for the small model and the other for the enlarging. Each consists of a stiffish lath with one end tapered off to form a point at its top edge (see Figs. 75 and 76), and a headless nail or pin fixed neatly and firmly into it, so that you have a

point of metal instead of wood, which would easily wear away. Then the inches, half-inches, and other parts of the inch are set out on this, beginning from the extreme nail or pin point, and the lines are ruled through, at each inch and part of the inch. The figures should in all cases be carefully and clearly put in, especially on the large chassis, in order that they may be easily seen from below.

Now everything is ready—*i.e.* your plumb-lines, your T-shaped piece for "distance-down" measurements, and your pointer for "distance-in" measurements; and as you arrange the two former on your small chassis, so you arrange the two in their relative positions on the large chassis. Then the measurement-in is taken with the pointer on the small model at any distance down on the suspended rule. In this way you obtain your point, which would read something like this, for instance: from front view plumb-line over the $3\frac{1}{2}$ "down at" 10 on hanging movable rule or stick "distance-in" from this last number $9\frac{1}{2}$.

This having been done, say, from the front, you would next try the distance-in of this same point from the side most convenient, and so your plumb-lines would be arranged in their relative places, to find the "in from side" distance. To begin with, you would have the main iron support fixed on the banker, and build upon it your armature, defining its position, projection, angle, &c., by means of measurements taken over the chassis, so that the strongest iron pieces, made by the smith, which may be required, can be fixed firmly and definitely without any fear of their being put in any other than the exact relative position to the small model.

With the irons fixed for the arms, legs, and such

other parts as may need to be of iron, much of the remaining armature can, and should, be built up with wood, and in such parts as the body or other big masses caged in with laths to keep the whole as light as is prudently possible. In short, a skeleton of wood built on the main iron supports is the thing to make. This must be built out (in the case of a 12-foot figure) to within 2 or 3 inches of what will ultimately be the front surface of the clay. This means that a figure of 12 feet high need have, in no one place, more than a thickness of about 3 inches of clay, provided that your small model has been carefully thought out and worked properly to scale.

When you have the whole of the armature erected, the first point to be fixed in the clay is the pit of the neck. This point will have been the first and most important consideration in the armature stage, but you will have fixed this somewhat back so that it will be as nearly as possible in the centre of the neck, and therefore will easily receive the thickness of clay necessary to cover it. It is well to know that this point in the pit of the neck is likely to come forward a little as the amount of clay put on the figure increases. It is, therefore, advisable at the commencement to fix this point a little further in, say an inch in a 12-foot statue. Again, it is wise to keep all the points a fraction high up at first, as there is every likelihood in the early stages of the clay sinking, if only a fraction. The contraction in the clay later brings about some slight change, so that all your points need testing from time to time.

Whenever you take a point on your small model, it is advisable to mark it with a pencil by making a

small dot, which you will find useful when you proceed to model up the large work. Your points should be taken on a system, somewhat horizontally and perpendicularly in lines, as, for instance, down the main folds and down in the hollows as well as across them, and not by taking a point, say, on the shoulder and the next some distance away.

Square-topped pegs with pointed ends should be inserted into the clay at every point put in on the large model. These should be made long enough (some perhaps nearly 2 inches for a figure of this size) to enable you to pull them out some distance if necessary, leaving them still imbedded sufficiently far in the clay to hold in their place.

It is important, when taking and putting in points, that your pointing-stick should be held horizontally at right angles to the plumb-line, and that your pegs should be pushed in straight, as a continuation, so to speak, of the pointing-stick. At times the callipers and compasses will be found useful for taking points which are not easily obtained from measuring on the chassis. Such measurements should be taken from two points on the small model and then put on the small pointing-stick, and afterwards the corresponding measurement taken from the enlarged pointing-stick (when it is more than likely larger compasses or callipers will be required) and tried on the clay figure.

When you have put points in over the whole figure and have filled in the parts between these until the pegs are seen projecting only just above the surface of the clay, your small chassis may be removed and the top of the pedestal freed, so that it can revolve, and the turn-table or banker upon which your large figure stands may also be freed. After this you may

set to work upon modelling the surface, and remove such of the pegs as you wish, for if these have been carefully put in there is little need to fear that by extracting them you will get far away from a very accurate enlargement of your small model.

CHAPTER XV

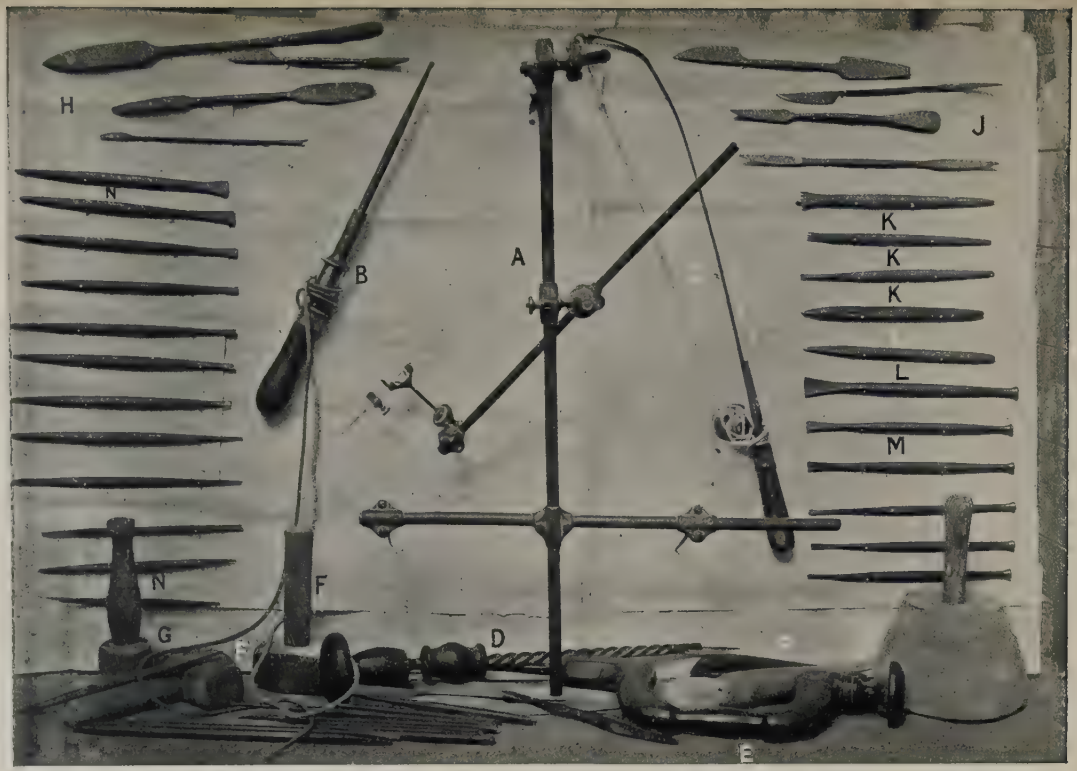
MARBLE CARVING

Every student of modelling whose wish it is to become a sculptor should learn to carve, for, correctly speaking, only he is a sculptor who carves a shape (whether a figure or other form) out of a solid mass of stone or wood. A man who builds up a work in clay, be it never so large, is only a modeller; yet his object may be sculpture, and the treatment of such a work sculpturesque. But before it can truly become sculpture it must be converted into a carved work.

Many of the early works, it is said, were carved direct out of the stone or wood, without models having previously been made for them. There are some men who do this to-day, but they are few.

The general method now is, and since the earliest times has always been, to make the work in either clay or wax first, and after having cast it into the harder material of plaster, to use this as a model from which to copy. This is to guide you in the process of expressing your idea in the ultimate material, say, for instance, marble.

By this principle a great deal of risk is lessened, because you will have tried many experiments in your softer and more pliable material before obtaining what you want; whereas, had you started right away in the marble, any error which you may have made in taking off too much could not be mended.



A Set of Marble Pointing and Carving Tools Fig. LXXVII

A, pointing instrument; B, a drill, worked or driven with a cord by an assistant; C, bow for working drill single-handed; D, Archimedean drill; E, stack and bits; F, carving hammers; G, zinc mallet; H and J, rifflers; K, claw tools; L, point tools; M, soft stone chisels and gouges; N, marble-carving chisels, various sizes; O, dusting brush; P, pitchers.

Fig. LXXVIII

Pointing a Figure in Relief—The Instrument on the Plaster Model

Note the needle point is being pushed down to the surface of a point on the drapery.

From a work by Thomas Brock, Esq., R.A., and by his kind permission this illustration is shown.

Fig. LXXIX

POINTING A FIGURE IN RELIEF—THE POINTING INSTRUMENT TRANSFERRED TO THE MARBLE

It will be noticed that little marble remains to be taken off before pointing is completed.

By the kind permission of Thomas Brock, Esq., R.A., this illustration is shown.

When you have before you your idea definitely expressed in a plastic form, an accurate conversion into the marble is fairly certain, provided that care is exercised in the "pointing" process, in the "preparing" stage, and ultimately the "carving," *i.e.* the finishing. The artist needs only do the "carving" if he has, in the first instance, made a carefully finished model, a fine work in the plaster; and the marble can be a masterpiece.

The intermediate stages between the plaster and the finish or carving are purely mechanical. It is, however, as well that the student should know them, and be capable of carrying out the whole work from beginning to end if this be necessary. The more mechanical part of the work, the pointing, is truly laborious in a work of any size.

We will suppose that you have a finished model in plaster, and that you have selected a block of marble of a suitable size, and as free as it is possible to tell, from colour, vein, or flaw: a great difficulty, it must be confessed, for even the experts in marble are unable to detect colour which may be much below the surface of the block.

The test that can be made is to wash the marble with clean water, and the moisture will show up immediately any veins or specks of colour, even though these may be a little below the surface; and with experience, tapping the block with an iron hammer may in some instances prove its soundness or otherwise, the ring being less clear when there is a flaw or vent in the marble than it would be in that of a sound piece. These flaws, it may be mentioned, have generally been caused at the time of the blasting from the quarries, or at the time of bursting (severing) the marble from a larger block.

The block of marble now in your studio is placed in its correct position on a banker, and the plaster model placed beside it on another banker or modelling stand.

Three points are now selected on your model, and three corresponding ones upon the block of marble. These latter points are found on the marble by the pointing machine, which is nothing more than a contrivance for taking measurements, it having been adjusted correctly to the points on the model and transferred to the stone.

The three points on both plaster and marble are made permanent and kept immovable until the work is quite or nearly finished, by means of imbedding, in a little moist plaster, copper rivets somewhat like drawing pins with little holes drilled in the centre of their heads. In these holes the three needle points of the arms of the pointing instrument can rest each time the instrument is put on to the model or the marble for the purpose of taking a "point" (measurement).

Little drilled holes will suffice at first to hold the instrument on the marble, the material being sufficiently hard to withstand the continued insertion of the arm pins without wearing these holes larger, though it is better and safer to put the copper rivets in at the beginning.

From the main or perpendicular rod a movable arm springs out, and from this another arm, through the end of which passes a movable needle, worked on a ball and socket. The needle is actually the part which is pushed down to the surface of the model, and gauges the depth down to the surface of any particular part which you may wish to take. The first point to be taken is the most projecting

Fig. LXXX

Pointing a Portrait Relief—The Pointing Instrument transferred to the Marble

Note the marble (being a thin slab) is fixed (with plaster) on to a thicker bed of stone, to keep it steady and to prevent its breaking in the process of pointing and carving.

Fig. LXXXI

Pointing a Portrait Relief—The Pointing Instrument on the Plaster Model. Taking a Point on the Moustache

one; on a face this would be the nose. When the point has been taken, the needle is fixed by a little thumbscrew so that it can go no further, but will draw away in an outward direction sufficiently far to escape touching the marble (when the instrument is transferred to it) which has to be carved away.

When the instrument is transferred from the model to the block of marble it will be seen that the needle cannot be pushed forward to its full, and that the chipping away must begin to allow this needle to go further home; when a fair amount of marble has been taken away from this particular part, the instrument is again put on the marble, and the needle pushed still further in. When it is found that the needle goes in to about a quarter of an inch of its required distance, then a hole is drilled with a "driller" to what is thought to be nearly enough; the needle is once again pushed in to see how little more drilling is necessary; then the needle is removed and the point made deeper; *the most important thing being to avoid making the point too deep.* A good pointer will keep all his "points" a little "full," by never allowing the needle to go quite home, by about the 32nd of an inch or less. All the other points are taken in the same way. The arms of the instrument and needle being adjusted according to the position of the points to be taken, the points all over will probably be not more than a quarter of an inch apart, *i.e.* on the important parts, such as the features, or, it may be said, any of the flesh parts. On drapery, where there are broad planes, fewer points are necessary.

The appearance of a work when pointed is not pleasing, covered all over with innumerable holes,

and little mounds of marble projecting between these holes.

Now comes the work of "preparing," carving down the projecting mounds to nearly the level of the points, when the form begins to assert itself; and here care is needed.

It is in such a state that the artist must take the work up himself, unless he has a very skilful carver, who can carry it still further. Even then the artist will find much that he alone can express properly, if it must have the same spirit as the original; for it will be found that not only does the transcription into marble give a little different effect, by reason of the change of material, but the artist may wish to quiet or emphasize parts—indeed, he may wish to make many little alterations, which he alone feels, and can do. And so, when the points are left "full," such work can be done more easily than if the points had been drilled right home. Hence the importance of every modelling student practising to carve.

If a student can copy form in clay, he can soon learn to carve it in marble, though I do not say with the same skill as one who has devoted his whole life to marble-cutting. I have seen really fine works in plaster lose much of the character of the artist's touch by being carved too dexterously, until they were nothing more than mechanical reproductions. Yet they may have been very accurate copies in a general sense. In short, they lacked the sense of touch which the artist alone could have given.

Skilful cutting or carving in marble does not make a work of art or even a fine carving. It is the expression given by each and every touch which makes the work.

The student will find that the "darks" in marble

never appear so strong as in the plaster model. This is accounted for by the transparency of the material, and in some instances by the greater reflecting power in marble than in plaster or clay. It is useless to deepen a hollow after you have cut it a certain depth, if you wish to obtain a darker shadow; because it becomes lighter and less dense by the greater amount of reflected light. As marble is more transparent than either plaster or flesh, if the nostrils are cut up as high, or the wings of the nose as thin (in the inside), as in nature, there is scarcely any "dark," certainly nothing like the amount there is in nature. More particularly is this the case when the work is executed in some of the best statuary marbles, which are more transparent than others.

"Sicilian" marble, or Bianco Chiaro (clear white) as the Italians call it, being of a less transparent nature, and rather heavier and colder in colour, retains more density in the "dark" of the hollows, and in the shadows. Sicilian marble is used for exterior purposes, especially in a country like ours, where the climatic effects are so disastrous as to make the finer statuary marbles crumble away in no time.

The reason for this marble being called Sicilian by the English is, I believe, unknown, though it is thought by some that it derived this name Sicilian perhaps because it was formerly shipped to Sicily and thence to an English port.

The choicest marble of all for ideal work, the nude or portraiture, for interior purposes, is Serravezza, though there is a Greek marble called Pentelic which is preferred by some sculptors; this marble, which is found in the island of Paros and at Mount Pentelicus, has larger crystals than the statuary of Carrara, is extremely hard, and does not, I think, cut quite so

freely as the beautiful marble of Serravezza. Pentelic was chiefly used by the ancient sculptors for their work. There are other qualities of marble, but those I have named are generally accepted as the "first" best. The cheaper statuary marbles are sugary and soft, and therefore not very lasting.

In marble it is not an uncommon thing to find minute pins of iron. These are very troublesome, being very difficult to cut away, and taking, as they do, piece after piece out of the best tempered tools. Sometimes they can be got down by riffles, but one has to take care not to cut too deeply into the marble on either side and around these pins in the attempt to remove them.

In Serravezza, as in most marbles, there appear sometimes what are termed "sand holes," which are almost more troublesome than the pins of iron, because they may occur at the very finish when the last touches are being put on the work, when but a powder of marble dust is leaving the parent stone, suddenly; in some cases they are as deep as a pea, so that cutting away down to the bottom of the crevice would mean ruining your work.

These holes can only be left, and afterwards filled with borax melted over a gas-jet in a clean spoon. A little of this, whilst still liquid, should be pressed into the crevice with a tool; any of the borax which is left on the surface may be cut away with a sharp knife. Although this is the best means I know for filling these holes, it is not altogether a satisfactory one, for in time the filling will contract somewhat, get loose, and either fall out or show a black line round where the borax has parted from the marble, more especially if the marble is frequently washed.

Most beginners in carving are lax in keeping their tools nicely sharpened. They too often go on working long after the edge has been taken off the steel. This is a great mistake, because a blunt tool not only jags and takes longer to cut, but the tools will not cut cleanly unless due consideration is given to them.

A flat piece of stone, York, should always be kept by your side, with a basin or cup of water, and a little of the water put from time to time on the stone to make it wet, the moisture preventing the steel from becoming hot whilst being rubbed.

By practice you will get used to a certain weight of hammer, and find yourself more at ease with the one you constantly use than with a strange one; therefore it is advisable that, like every good workman, you should have your own from the first.

In the process of carving a work, through all its stages from "pointing" to "finish," you will require to use two or three differently weighted hammers, the one required for the finishing touches, where but little gentle touches are necessary, naturally being lighter in weight than the one used at the beginning (the pointing), where in some instances quite big pieces are fetched away with the tool called the "pitcher" and afterwards the "pointer." Again, another strength is used at the intermediate stage, that of "preparing," when the tooth tool is brought constantly into use.

A carving hammer needs only be 2 lbs. in weight, though for "pointing" a heavier is required—about 4 lbs.—and for "preparing" one of 3 lbs. weight.

Beginners invariably cut too straight into the marble by holding their tools too much at right angles with the stone they are carving This, instead

of being a quick way of cutting the marble away, is indeed a slow one, and one which will very soon break the edge of the chisel. The chisel should be held in such a way as just to bite or grip the stone.

Round-nosed drills of varying size will be frequently brought into use, to drill away those hollows which cannot easily be got at with a chisel.

To go slowly is the proper course; and you will always be wise in taking off too little. More can always be taken off, but never put on. The marble should always be covered up with a clean white cloth when it is not being worked upon; otherwise it will quickly get discoloured from dust and dirt, and such fresh cutting as you do to it will be whiter and the effect produced will be patchy and misleading.

A student wishing to learn to carve will do well to work something out of a soft stone to begin with, and thus get command of the hammer and chisel, before he takes to cutting in the harder stones.

CHAPTER XVI

A FINAL NOTE

As I ventured to explain in my Preface, I make no pretence to literary skill in setting forth the contents of this volume, having been solely actuated by a personal and genuine desire to set before the student of the plastic and glyptic art the methods of the various processes and the simplest, because the most straightforward, way of obtaining results therefrom. So in this concluding chapter, gathering up the preceding pages, as it were, into one final whole, let me say that if I have arrived at writing what may prove of practical value to the earnest, hard-working student, if I have simplified his work ever so little by pointing out the right methods and guiding him away from the wrong, I shall have achieved my object. It has been, for the most part, a labour of love to write of these things, of which many years of practical experience have given me a considerable knowledge.

Were I asked to name the greatest asset in an artistic career, I should answer, "Indomitable perseverance, courage, and determination." Without these and a belief in the power you possess, nothing of any real or enduring value can possibly be accomplished. However glorious the vision, however lofty the ideal, however true the aim you have set before yourself, nothing but perseverance, determined and

unceasing, will ever take you to the goal of your desire. The highest resolve, the greatest enthusiasm, are futile without hard work—how hard and unsparing only those can ever really know who have chosen the pursuit of art as a means of livelihood.

You must surrender yourself—all your thoughts—your very existence—if you would attain! Never must your aspirations leave you; cherish them as life's most precious gift. There is the height you have set yourself to gain.

I cannot too strongly impress on students, on the young student especially, the virtue of moderation in all things. Extremes are bad at all times. Vulgarity is unpardonable in art.

Artists possess, or at least are supposed to possess, more sensitive nerves than the ordinary business-like, matter-of-fact mortal, and at times a brain-storm occurs, when all their labours seem futile, inept, worthless; the vision has fled; the deepest gloom of depression overwhelms them; the toil and careful studies of years seem empty and useless.

When such fits occur, leave the work on which you may be engaged entirely alone, for if you still persist in attempting the impossible, failure, utter and complete, is bound to attend your most strenuous efforts.

Go at once into the air. Throw off the cramping influence of the studio, and study Nature in her varied and strangely variable moods. Nature alone possesses restorative balm, and if you view the manifold marvels of her works with loving reverence, her myriad spectacles of beauty so infinite, of diversity so extraordinary, with a seeing eye, calm will follow the brain-storm, the feeling of revolt will cease and die away, and you will glad-heartedly

return to your work, refreshed and strengthened alike in mind and body. No longer will you find all things stale, flat, and unprofitable.

When a student can indulge in foreign travel it should prove of the greatest service to him. Not only does travelling enlarge his outlook on life and dispel many insular prejudices, but it affords him the opportunity of seeing what students are doing in other countries, as well as of becoming acquainted with some of the masterpieces both of ancient and modern sculpture. It gives him an insight into the methods of work in other studios than his own, and will certainly brush away many prejudices, which otherwise would remain fixed ideas in his mind.

A student cannot study too closely, or too often, the wonderful collections of statuary which are to be found in our own museums and galleries, many of which, especially those of the Greek and early Italian schools, are unrivalled throughout the length and breadth of Europe.

Above and before all, I repeat, study Nature. None of her works are mean, low, ugly, or vulgar to those who, with the patience born of reverent love, seek out her marvellous and minute beauties.

The skulls and bones of all animals and birds are marvels of construction. The skin and flesh are but the draping of the frame; the skeleton is just as beautiful beneath its covering. Look into the heart of things, into their very core: the superficial is not all we see. To all with eyes to see, manifold beauties start from what before seemed but an empty shell. So store your mind with beauty infinite, and it will follow that your work will be full of interest. A thousand fancies from a single leaf spring to life,

Fig. LXXXII

A Corner in Mr. Brock's Carving Studio

By kind permission of Thomas Brock, Esq., R.A.

as memory brings to the brain the rapture you felt when you found how beautiful all is in Nature.

With this exhortation I close, commending these pages to the perusal of the student, in the earnest hope that they may prove practically useful. I remember the immense, almost insuperable, difficulties of my earliest art days, and I have sought to make these difficulties less formidable for him. Although utterly unaccustomed to literary effort, I have found a pleasure in writing, for all that I have here set down is the result of my own arduous experience.

PART II

A FEW MASTERPIECES CONSIDERED

A FEW MASTERPIECES CONSIDERED

THE student cannot acquaint himself either too soon or too well with the best examples of sculpture from the earliest periods, which are to be found in our museums, for it takes years of close association with the great masterpieces before one can realise to the fullest extent the immensity of these creations. For the finest sculptured pieces, like the finest compositions, musical, poetic, or literary, require an educated mind properly to appreciate or understand them—a mind which has been given up to them for a long time. You are told from the first moment of your existence in the study of art that these works are great, but that this is so, you are not at that time really convinced in your own mind. You have to learn something before you can realise it for yourself, and that learning must come through the study of Nature. I therefore advise you to study Nature and the masterpieces at one and the same time, so to speak, by devoting, say, alternate days to each so far as you can, to work from the life to-day, and to-morrow to go into the presence of the masterpieces. You will then quite soon begin to feel that a close relationship exists between Nature and what, up till quite recently, appeared to you idealised or unfamiliar form.

The student will soon learn that these great works were built from the same Nature with which he himself is daily confronted. For the guidance of

the student, I propose commenting briefly upon a few of those which rank, as I consider, amongst the finest sculptured works to be found in our museums, and in some instances in our schools of art. Space will not permit of my saying much, and the periods from which I select works to speak of must therefore be selected on broad principles.

At a period of nearly 3000 years B.C. the Assyrian and Egyptian artists were producing great sculptural works, many fine specimens of which are now to be found in our museums. That Assyrian and Egyptian art has influenced all ages from the Greek to the present, is not at all surprising when we see from their architecture what masters they were of construction and design—in the former how profoundly substantial, and in the latter how simple and grand. Their carvings upon the walls of these buildings of relief work introduce figures, animals, and hieroglyphics, in many instances in quite a curious way, yet ever beautiful in pattern and in decorative effect. Strange as some of their works may appear at first, they will on close acquaintance establish in the spectator's mind the fact that many of them are full of life and truth to nature. This applies not only to the statues but particularly to the bas-reliefs, many of which are extraordinarily realistic and most charming in relief treatment. The Egyptians had a method of sometimes carving their reliefs in a way seldom if ever practised by sculptors since them, except in frank imitation; that is to say, on a flat ground surface they drew their design, their figure, and so on, with a fairly deep incised outline, then carved the form into it, inside these outlines, leaving the original ground surface standing up above the

PLATES I AND II

EGYPTIAN CARVING IN RELIEF

The British Museum

PLATE I

Many of the Egyptian carvings on their sepulchral and other steles were first drawn on to the stone with a deep incised outline. The relief was then carved within this outline, so that the ground surface remains at its original projection, while the carving, in a relief treatment, is somewhat lower. To this method is greatly due the preservation of the carving.

PLATE II

In this example we get the work at the top carved in relief and the background set back, whilst in the lower portion the relief work is carved within the outlines, and the groundwork, i.e. *the original face of the stone, is left projecting beyond.*

Plate I

Plate II

PLATE III

AN EGYPTIAN PRIEST AND PRIESTESS

The British Museum

Simplicity of pose characterises all the Egyptian statues, and the group of Priest and Priestess is no exception to the rule, though there existed a keen desire to be elaborate in the decoration of their garments both by carving and by the painting upon them. The invariable method adopted was that of gauging out a number of parallel lines in the draperies and wearing apparel generally. Mark well the grand and solemn dignity of this work, and the ease of both figures.

Plate III

PRIEST AND PRIESTESS

carved sunken relief work. This was done in many of their sepulchral and other steles, most of them in limestone, though the Egyptians worked to a great extent in granite. (See Plates 1 and 2.) See with what solemn dignity the priest and his wife are seated—the simplicity of pose and treatment and the refinement of the whole. The Egyptians valued greatly the repetition of straight lines, parallelism both horizontal and perpendicular. The Greeks were not slow to adopt the use of this. Some of the most wonderful bas-relief works of all time are those of the reign of Assur-Nasir-Pal, King of Assyria 860 B.C. Those representing the king himself, with his winged mythological attendants, are splendid; but the Bull Hunt, the Lion Hunt, and indeed the whole series to which they belong, are marvellously fine as works of relief carving, design, drawing, treatment, and realism. The animals, in particular, are based upon the true forms in nature. The life and spirit with which these sculptors imbued their work is astounding, however quaint and queer the actions of their figures may in most instances appear to us, with their limbs bent at the joints at right angles, and with so many rigid straight lines in their costumes. Although almost actual repetition appears both in curved, angular, and straight lines, the result is never monotony, for these lines are always of value in the works.

When we come to the Greek, I cannot but make straightway for the figures from the Parthenon. These figures, which adorned the pediments of the most beautiful work of antiquity ever accomplished, are in most instances fragments, mutilated remains, of magnificent artistic conception, surpassing all other works of all time.

To Phidias, the giant among sculptors, who lived about 500 years B.C., we owe the birth of these most noble conceptions, these glorious and incomparable renderings of the most beautiful forms to be found in nature.

Look at the figure of the Theseus, and also that of the Ilissos, and you will come to recognise that they are unquestionably the finest specimens of Art—which is to be defined as Nature seen through an artistic mind. The construction of each figure is perfect, the movement sublime, the bigness and simplicity of the detail and the whole, amazing. All is as broad and simple as possible, yet full and rich in quality; nothing poor or small, nothing cold, dead, or still, yet all reposeful.

Look at the wonderful construction and the magnificent drawing in the torso and legs of the Theseus, and mark well the splendid firmness of the planes.

When we turn to look at the movement in the body of the Ilissos, we ask ourselves if movement was ever produced in sculpture with such style—the whole body is turned in a way which, from the hands of a less great master, would suggest muscular exertion, but this sublime genius has given us perfect rest; all is freed from violence. It is a perfect transcript of nature as seen through a mighty mind.

Observe the grand construction of the thorax, and the marvellously beautiful movement of the torso, and how the right leg grows or springs out from the torso. Can anything finer be imagined? Again, examine the back; it is as fine as the front; see the quality and value of all the hollows in this noble figure, and realise how grand is this selection from the finest nature. To my thinking, this figure is even finer than the Theseus.

PLATES IV AND V

ASSYRIAN RELIEF CARVING

The British Museum

These reliefs are extremely decorative, and valuable for the student who is studying decorative relief-work. The simplicity of the surfaces and the value of repetition of lines, as in the heads and legs of the animals, should be noted, as well as the shapes of the spaces on the groundwork.

From a photograph by Mansell & Co.

Plate IV

From a photograph by Mansell & Co.

Plate V

PLATE VI

THESEUS

The British Museum

PLATE VII

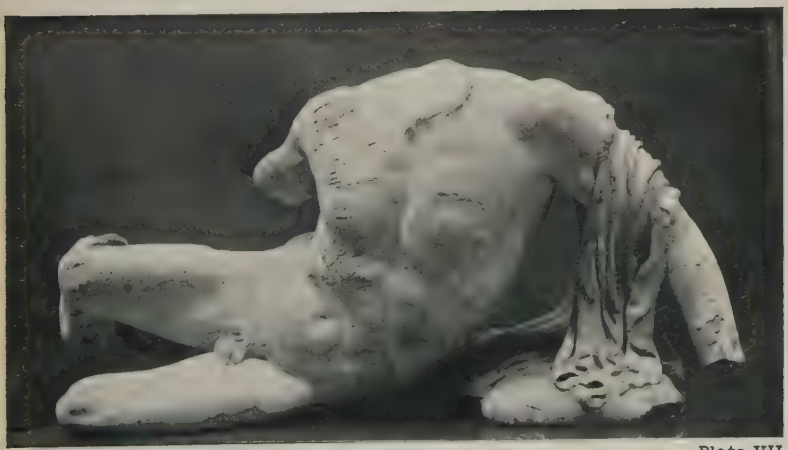
ILISSOS

The British Museum

Grander form was never seen in Art or Nature than in these two examples of Greek Sculpture. They represent the noblest forms in Nature as seen through the mind of a sublime genius. Note that there is no attempt at any exaggerated pose, and if the body is moved at all in action, as in the case of the Ilissos, it is done with such ease that all the effect is obtained with perfect repose. Of all works, the student cannot do better than keep himself in constant touch with these great masterpieces.

From photograph by Mansell & Co. **Plate VI**

THESEUS



From a photograph by Mansell & Co. **Plate VII**

ILISSOS

From a photograph by Mansell & Co.

Plate VIII

THE THREE FATES

Never was the human form more exquisitely draped than in the case of the group of The Fates, and never did drapery cover grander form. The marvel is that the form is everywhere felt so beautifully through the drapery. Note the value of the radiating lines.

If you model anything from the antique before you have had a long study from the living model, then select these two masterpieces before all others to copy; they are nearer the finest nature, as we know it in after years, than perhaps any other work of which I can think. You will for this reason more quickly understand these than you will many other antique works. To make a copy of these statues should prove of immense value at any moment in a sculptor's career.

Nothing less than I have said of Theseus and Ilissos can be said of the Fates; equally great are these three daughters of Cecrops, which form a part of the eastern pediment of the Parthenon. Look at the one sister reposing in the lap of the other, the freedom of line, the ease of pose; the style of line and the richness throughout are beyond all praise.

Note how beautifully the form is expressed through, or under, the exquisitely arranged draperies, leaving you to believe that the nude figure must have been modelled in true form first, and afterwards the draperies put on. The purity in the design of these draperies is so convincing—but how monotonous, how hard, how cold and unsympathetic this drapery might have appeared had it been done by any less sublime genius. These figures all but breathe; you feel that parts of the flesh could be pressed in, so full of real nature are they.

These pieces of Greek antiquity might have been moulded and then cast from nature—if anything so mechanical as a cast could give what the mind and the eyes saw in the finest nature.

I cannot leave the works which adorn the Parthenon without calling the student's attention to the bas-reliefs from the frieze. This frieze is of

such a length (524 feet) that it needs a volume to itself, but space will permit of my mentioning it only as a whole, as a complete rhythm of grand dignity of composition: the vigorous action and life displayed are enormous. The entire Procession seems to be moving, and yet still and dignified, as all fine sculpture is. Note the simplicity of this frieze and yet the richness of it; how beautifully it is filled; the delightfully rich pattern it makes; the spaces in between the relief, the subjects, how interesting; the colour—by this I mean the effect of light and shade, the value of the lines, repeated in so many instances, yet never monotonous; the value-uses of perpendicular lines, as contrasted with horizontal ones. Note how much the front surface of the marble has been retained, so as to co-ordinate it with the architectural portion; how completely this frieze fits its position. How firm is the form, and how grand the spirit. Here is a lesson for us in relief decoration; to be never noisy or vulgar, but ever quiet and dignified like nature at its best. To make no attempt at pictorial effect. The planes to be simple and broad, and no effort to be made at unnecessary perspective or great variety in relief, but all perfect completeness. It is thus that truth is handled by a master hand!

The relief figures on the sculptured pier from the Temple of Diana (Artemision), Ephesus (B.M., No. 1204), belong to the highest standard in sculpture: see the delightful arrangement of drapery on the female figures, the value of the scale of one part to another. The dignity of the headless woman is great. How purely sculpturesque all these Greek works are. Selection and treatment of true form were the first aim of the Greek sculptor.

PLATES IX AND X

BAS-RELIEFS FROM THE PARTHENON FRIEZE

The British Museum

It is difficult to select a portion of a whole which is so noble and so complete without a feeling of regret that it, and any remarks respecting it, can be but fragmentary. Attention should be drawn to the wonderful style of line which exists in the smallest portion as it does throughout the whole of this frieze. Observe, for example, the line down from the nose of the ox in relation to the front line down the figure on this side of the animal. Apart from the magnificent treatment of relief work and other striking merits which this piece possesses, the quality and style of the outline are everywhere superb. I would advise the student constantly to let his eye travel along these outlines, in order thoroughly to recognise their significance.

From a photograph by Mansell & Co. **Plate IX**

From a photograph by Mansell & Co. **Plate X**

BAS-RELIEFS FROM THE PARTHENON FRIEZE.

From a photograph by Mansell & Co.

Plate XI

SCULPTURED PIER FROM THE TEMPLE OF DIANA

The arrangement of figures against a column or drum shaped ground involves more difficulties than when on a flat surface, for the outlines seen at the extreme sides have to be considered in respect of their silhouette as well as the front view—without the chief lines of the column being entirely lost or too much broken up by over-great projection. Note the arrangement of the drapery on the female figure—that is to say, the value of horizontal lines as against upright ones, and also the value of the radiating lines in the drapery from the hand.

PLATE XII

THE NIKE OF SAMOTHRACE

This may be called the Victory of Victories, for no greater Victory was ever achieved than the making of this great work. One almost hears the wind blowing the soft, thin drapery up against the beautifully soft, rounded form of this graceful figure. Note how the form of the figure is traced through and under the drapery, only lost to be found again the next moment.

Plate XII

From a photograph by Mansell & Co.

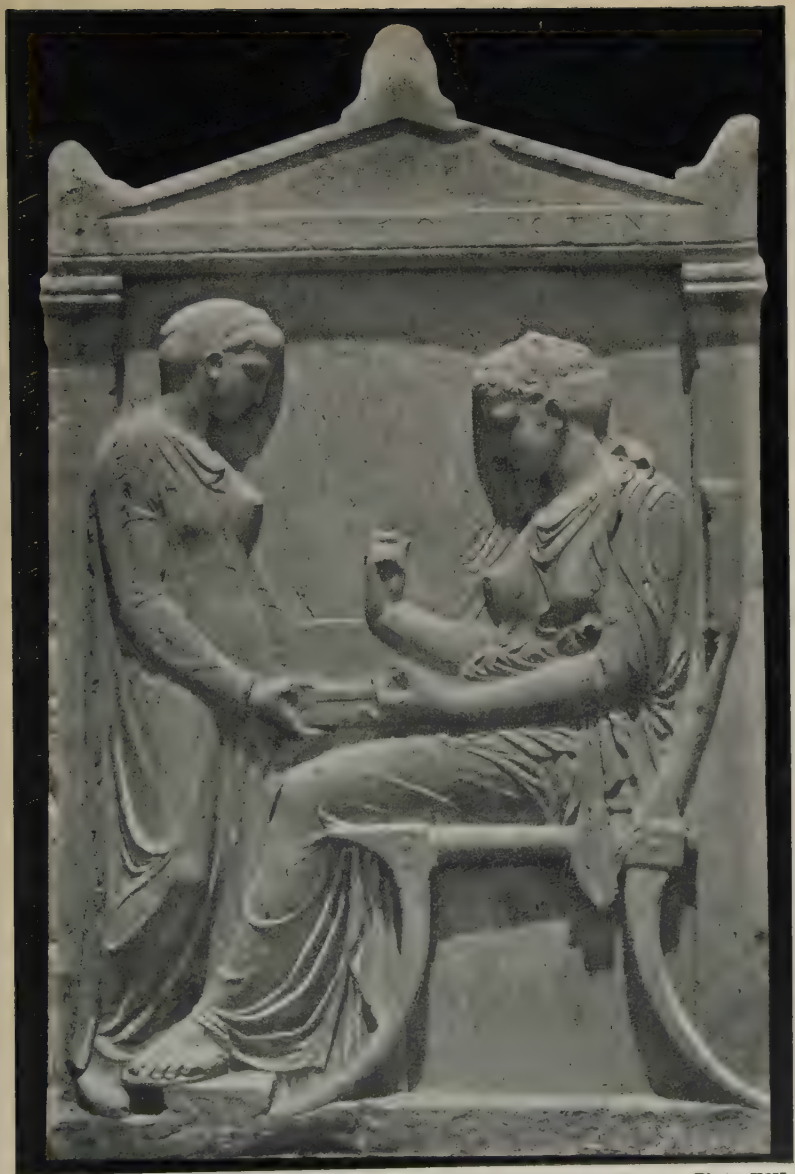
THE NIKE OF SAMOTHRACE

PLATE XIII

SEPULCHRAL MONUMENT OF HEGESO

The British Museum

A fine example of relief work. Observe the simplicity and purity of all the lines, and the absence of any attempt at elaboration of detail. Yet the whole is rich by reason of the value of the beautifully shaped plain parts as contrasted with those parts more cut up by the folds of the drapery. Note the exquisite shapes made by each mass of drapery and the value of perpendicular and horizontal lines in the design.



From a photograph by the English Photo Co.

Plate XIII

SEPULCHRAL MONUMENT OF HEGESO

From a photograph by Giraudon **Plate XIV**

LES ADIEUX. BY J. J. PERRAUD

In contrast to the sepulchral monument of Hegeso, reproduced in the preceding plate, this work is shown. The student will quickly see for himself that the over-filling of a panel and the over-elaboration of detail is a fault. This work is overdone everywhere, it is restless, and not in the least inspiring; but it may serve to point out to the student that an abundance of elaborate detail and cramming of work into a panel are not requisite to the production of a fine work.

PLATE XV

THE VENUS OF MELOS

Louvre

Seldom if ever was more beautiful female form wrought out of a block of marble than this Venus of Melos—a Goddess in all her grace and tenderness of form. Note the construction of the whole figure, the grand simplicity of the detail, and the ease in the movement throughout. The neck grows out of shoulders in great style and carries the handsome head nobly.

From a photograph by Neurdein

Plate XV

THE VENUS OF MELOS

Plate XVI

From a photograph by Mansell & Co.

ASKLEPIOS

This grandly sculptured head of Asklepios is one to which all students should give special attention. The breadth and firmness of the modelling and drawing are remarkable, whilst the expression is placid and godlike. The treatment of the hair is splendid, and the colour in this, as contrasted with the pale face, is wonderfully well suggested.

For flowing drapery look at the wonderful Victory, the "Nike of Samothrace." In this you get intense movement—one feels the wind blowing as this figure sweeps through the air.

I can point to few more beautiful pieces of Greek relief work than the sepulchral monument of Hegeso, daughter of Proxenos (Athens, about 100 B.C.). The exquisite simplicity and purity of line in these figures is immense, whilst the style, arrangement, and treatment of the drapery, with its valuable perpendicular line, is perfect; all so severe, yet so easy. The shape of any one particular portion is beautiful and complete in itself. Observe how very firm the drawing is, and for this reason the value of the light and shade. Turned upside down or seen from any side, it is almost equally fine, which proves how splendid the shapes are and how well considered the lines.

For the student's benefit I should like to contrast this work, of which I just have spoken, with one in the Louvre, "Les Adieux," where it will be seen how everything is overdone, noisy, common, and what a want of quiet is needed. This work, to my mind, is as far from right as the other is near to perfection.

The Venus of Melos is perhaps one of the few statues almost fine enough to have come from the hand of Phidias, so great is the perfect harmony of the whole; and the pure and majestic style of this work places it amongst the greatest creations. The ease of the attitude and the bigness of its sculpturesque character should be appreciated by every one. This Venus is a goddess in all her grace and tenderness of form.

Let us look at just a few of the many fine busts and heads before we leave these galleries, wherein

we can find enough great works to fill volumes with praise without saying a word too much.

It appears to me that most of the Greek sculptors treated the heads on their figures and the heads on their busts with a little less nearness to nature than they did the figure parts, and that whilst they possess, in most cases, the finest form, I do not recognise a particularly strong individuality or a marked character. They appear rather as types than as individuals. Perhaps therein lies the secret of their sculpturesque breadth of treatment. Any insistence on individual characteristics might have lessened this quality.

That the Greeks coloured their statues is beyond doubt; that they considered colour in form an essential is also evident; more especially is this noticeable in the treatment of the hair, where the difference between a head with light hair and one with dark hair is obvious.

See what an amount of consideration, too, these Greeks gave to the arrangement of the hair; how beautifully sought out and followed are the masses, until they become splendid, rich pieces of design.

The more closely you study from nature the growth, movement, and shape of the masses of the hair, the more you will see how near the Greeks are to the truth in these details.

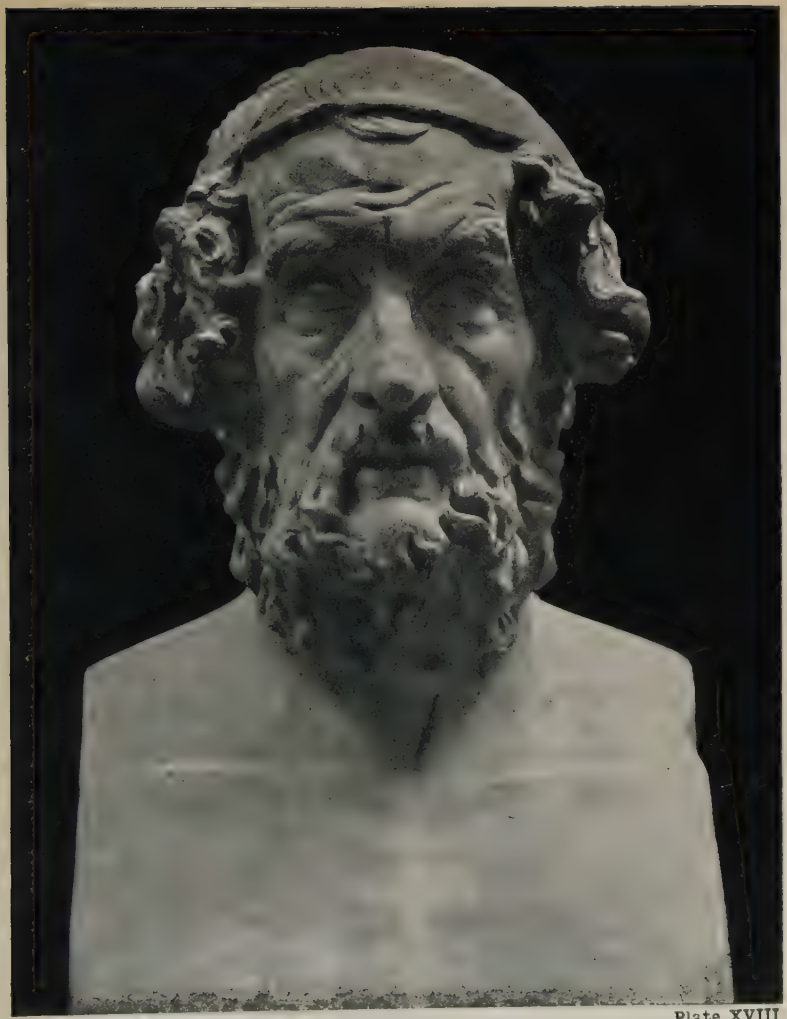
Look at the splendid head of Asklepios (B.M., No. 550). The face simple, broad, and strong, yet pale, encircled by a rich treatment of hair. This applies to many of their heads, the hair being so often cut up—full of light and shade—to give a contrast in colour to that of the face, as between flesh and hair, though these parts never appear noisy or common.

From a photograph by Mansell & Co.

Plate XVII

APHRODITE

The lesson in this mask is that to be derived from the big, broad, and firm modelling, the beautiful simplicity of the treatment, and the ease of the movement conveyed.



From a photograph by Mansell & Co.

Plate XVIII

HOMER

The fine, sculpturesque treatment of this work places it among the best busts of all time. The firm construction of the whole head and nervous drawing in the detail are remarkable. Note the drawing up the sides of the face, over the cheek-bones, and up the temple bones. Again observe the wonderful treatment of the eyes; they appear as blind, and yet are full of expression.

PLATE XIX

TORSO OF APHRODITE

The British Museum

The treatment of this charming torso is so big that it might well be taken for life size. Its full rounded form, with rich hollows and ease of movement, place it amongst the noblest of works. Note how beautifully simple the drawing is throughout, and how broad and exquisite the modelling through the hollows.

From a photograph by Mansell & Co.

Plate XIX

TORSO OF APHRODITE

PLATE XX

HEAD OF A YOUNG MAN

The British Museum

A finely carved head of a young man, sculpturesque in treatment and firmly posed on the shoulders. The hair is somewhat conventional and not so good as in the best Greek heads, though the features are grand in their big, fine form, and the construction is perfect. A head valuable for the student to study.

From a photograph by Mansell & Co.

Plate XX

HEAD OF A YOUNG MAN

PLATE XXI

MIDAS

The British Museum

A beautifully refined piece of decorative sculpture, delightful in sentiment and sense of scale of one part to another. It is, of course, conventional, or, rather, formal; but it is none the less a fine work. The treatment of hair and head-dress and the beard should be carefully observed, as should also the arrangement of the drapery.

From a photograph by Mansell & Co. **Plate XXI**

MIDAS

Plate XXII

A Portion of a Tabernacle

An example of low relief modelling in which some of the figures (i.e. *the front ones*) *are lifted quite a distance from the background, yet do not change the style of relief from those which remain set back close up to it. Note the treatment of, and on, the projection between the outlines of figures in the foreground and those in the background as being the same, so that there is a "togetherness," or uniformity, in the whole.*

And for strength, look at the head of Hercules (B.M., No. 1736). It is enormously powerful; see, too, how fine is the bronze head of Aphrodite; there is an example of the best period of Greek art: simplicity and style; and the flesh big, firm, and full in quality. One side of the face may be out in construction as related to the other; but this has come about, I should say, by having been dented or knocked in by damage at some time.

I do not intend to dwell upon the Roman period, because I feel that what space I have now to spare were best spent (after leaving the Greeks) with the early Italians; therefore, after a glance round at the Romans, we will hasten to the Italian masters.

In these Roman busts and statues there is a more varied difference of character in the features than we have found with the Greeks. Indeed, the Romans went more nearly for getting the character (personality) of the individual man or woman. That they liked to preserve a likeness of their departed is well known, for it was their custom to take wax moulds and casts from the face after death. The mask, we are told, would be worn by one of the mourners, who would also wear the cloth insignia of the departed in the funeral procession. The wax models could not have been made for any purpose of art, but simply as likenesses.

Though the features vary considerably, there is a great sameness in all, in the pose of the head, general attitude, gesture, and indeed in dress and arrangement of draperies; so much so, that many of their busts of emperors might almost have been taken from the same mould with different features put on them.

A FEW MASTERPIECES CONSIDERED

A few of the best examples of the Græco-Roman pieces are the following :—

The head of Homer, Baiæ, in the British Museum (Græco-Roman, No. 1825). This is a very fine head, strongly modelled and full of character. Besides, there is in this head of the blind poet tender nervous drawing in the detail, and play of movement in the parts. Note how well the cheek-bones are drawn. The sorrowful expression gives you the complete idea of one who is blind.

The Torso of Aphrodite (B.M., Græco-Roman, No. 1580) is one of the very finest bits of Græco-Roman sculpture, beautifully simple, full rounded form, warm flesh, the hollows broad and full of movement: a work to be studied.

The Head of Mercury (Hermes) (B.M., Græco-Roman, No. 1612). The face of this work and the treatment of the hair (conventional though it be) are very strong and full of character.

Again, the heroic head of a young man (B.M., No. 1785) is one of the best examples of Græco-Roman busts. A splendidly balanced head, with fine form and great ease in the pose.

Before leaving this period, let me draw attention to the exquisitely beautiful terminal figure of Midas, with its gloriously refined head and beard, its charmingly designed drapery, its homogeneous completeness. It is a perfect piece of decorative sculpture.

The moment you enter a gallery of the sculpture of the early Italian artists, you are surrounded by so many great works that it is only with difficulty you can decide where to make a start, or what to look at first. The names of Donatello, Verrocchio, Mino da Fiesole, Michael Angelo, Cellini, and a host

PLATE XXIII

HEAD OF ST. JOHN THE BAPTIST

School of Della Robbia

South Kensington Museum

This head could hardly be surpassed for subtlety of drawing and modelling. The transition from one plane to another is extremely gentle and easy. Nothing but making a most faithful copy can bring home to the student a complete idea of this work. Exaggeration, however slight, of any part will change the effect of the whole, and the copy will wholly lose its resemblance. For this reason it is a very difficult work for the student to copy, and consequently affords excellent discipline.

Plate XXIII

HEAD OF ST. JOHN THE BAPTIST. SCHOOL OF DELLA ROBBIA

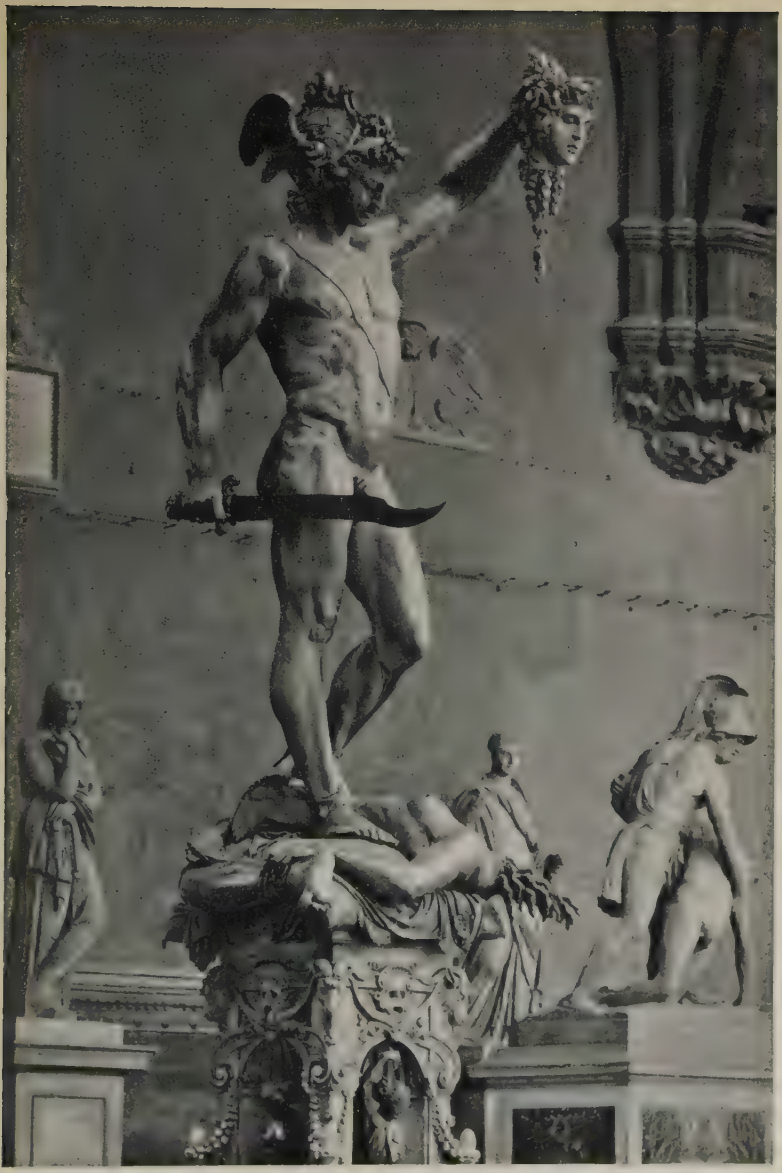
PLATE XXIV

PERSEUS

B. Cellini

Florence

It will be easily seen by those who have had however elementary a training in modelling that this work is one essentially suited to bronze. The outstretched arm holding a mass such as the head in this instance would not only be difficult to work in marble because of the danger of its breaking off in progress, but would ever look uncomfortable in stone. Furthermore, the sword and head-dress, or helmet, are not suitable for a stone treatment, and the whole mass of this figure, supported on one leg only, would condemn it as unsuitable for any material other than metal.



From a photograph by Alinari

Plate XXIV

PERSEUS. BY B. CELLINI

From a photograph by Alinari

Plate XXV

NICCOLO MACHIAVELLI TERRA-COTTA OF THE FIFTEENTH CENTURY

Note the tenderness of the modelling about the features of this work, the delicacy with which the detail is treated, and the difference of texture observed between flesh and bone. Observe, too, how beautifully drawn are the nose and the parts around the eye and temple. The scale of the detail is very close to nature; indeed, the head, considered as a whole, is remarkably realistic in its rendering.

Plate XXVI

BUST IN TERRA-COTTA

It is difficult to point to any female bust of this period possessing more fine qualities than this work, ascribed to Donatello. The beautiful sense of nervous drawing and tender feeling is seen throughout this sweet head, so gentle and pure in character. With delightful ease the neck leads out of the womanly shoulders; the cartilage in the nose is perfectly felt, and the bone over the eye, temple, and cheek is not less finely expressed. The beautiful modelling round the mouth and the drawing up the face and over the cheek-bone to the forehead should be studied and analysed.

Plate XXVII

A Chimney-Piece.

Much of the detail in this chimney-piece is as sharp and crisp as if carved out of a hard marble. The variety of light and shade (or, as the sculptor terms it, colour) is remarkable; in parts the relief is almost lost in the ground, then it comes playfully up in high relief. The whole work is tender and refined in feeling, whilst the workmanship is exquisite in its artistic character.

Plate XXVIII

VIRGIN AND CHILD. BY DESIDERIO DA SETTIGNANO

*A beautiful example of fine drawing and delicate carving in low relief. With singular charm the outlines vary in strength of colour—*i.e. *in light and shade—and the whole work is distinguished by purity of feeling and execution.*

From a photograph by Mansell and Co.

Plate XXIX

BUST OF A LADY. BY DESIDERIO DA SETTIGNANO

A beautifully simple bust, unaffected in pose and treatment, quaint in character, and easy in movement. Note the modelling of the nose and over the eyes up into the brow, how subtlety, purity, and sweetness pervade it.

From a photograph by Mansell & Co.

Plate XXX

BUST OF A YOUNG MAN. BY ANTONIO POLLAIUOLO

A quaint bust treated in a very simple manner, with no effort at movement in pose or technique. It is charming in its unaffected style, and a delightful and rather archaic rendering of character in sculpture.

of others, all arouse intense enthusiasm and inspire one beyond expression.

Take the reliefs of Donatello; look at these for grace and beauty, tenderness and feeling, carried to the very end, finished, yet never tight or hard; the drawing and modelling are exquisite. The subtleness of planes, the colour (*i.e.* light and shade), are full of sweet variety and refinement of touch throughout.

Then take the busts of this same master. You feel yourself to be in the presence of living people —people whom you saw yesterday and might see to-day—so intimate are they, moving, yet full of reticence, stilled only by the master-hand; for though they almost breathe, they never startle you with their challenge. They are works of art, tenderly wrought after nature with a loving fidelity.

Examine the bust of a woman, called St. Cecilia (Victoria and Albert Museum, No. 7585). The growth of this neck from the shoulders is full of grace; the tender modelling around the nose and mouth, indeed the whole face, is extraordinarily sweet and pure. The head of a Lawyer is a masterpiece of construction, tender modelling, and character. And then look at the heads by Verrocchio, and those by Mino da Fiesole, Antonio Pollaiuolo, Desiderio da Settignano, and the many others you can find by the men of the Italian Renaissance period. These are the works for the student who is studying the head from life, in order to follow portrait sculpture. Let him note the delicate modelling throughout and in the details; see how the difference between bone and flesh is felt, appreciated, and tenderly expressed; how subtle, yet playful the movement of surface is in all cases, how sincerely every bit of detail has

been considered. What works of art these are! To find the like of them one has to go back to the great Greeks.

Before leaving I must take you before that consummate master, Michael Angelo, who followed close upon these men. This giant, who at the age of fifteen produced the head of a faun, left behind him so many great and important works that the wonder is that he ever found time to sleep in his ninety years of existence on earth. What a constitution and physique he must have had! One cannot help feeling his physique and constitution in everything he did. There can be no doubt that Michael Angelo was moved and inspired by the works of the great Greek masters; and from these men he saw his way to give us great sculpturesque creations, big nobleness of form being always uppermost in his mind when he carried out his mighty conceptions.

The amazingly fine construction and arrangement in all his works shows that from the first the suitability of the subject and adaptation of design to the material were thoroughly considered; the same is the case in respect of the treatment, always masterly.

His knowledge of the human form on and below the surface was marvellous, and the drawing everywhere very powerful. Together with other works by this master, look at the grand and mysterious recumbent figures on the dignified and majestic tombs of the Medici, and at the two statues of the Slaves; also at the head of the Virgin, which is so vigorous in treatment yet tender in expression; and then turn to the noble figure of Moses. To these and to the reproductions from the frescoes in the Sistine Chapel I commend all students of modelling for inspiration.

From a photograph by Mansell & Co.

Plate XXXI

HEAD OF VIRGIN

The strength of character displayed in this head marks it as a great work. It is designed essentially for marble, and the treatment is appropriate to the material. See the masterly power with which this unfinished work is wrought.

PLATE XXXII

MOSES

Michael Angelo

Rome

A masterpiece. This Moses is a very Moses in all his strength and wisdom—a grandly designed statue. Note the masterly treatment of the head and beard, the drapery magnificently wrought and arranged over the legs, and the stately pose of the figure.

From a photograph by Anderson

Plate XXXII

MOSES. BY MICHAEL ANGELO

From a photograph by Alinari

Plate XXXIII

TOMB OF LORENZO DE' MEDICI. BY MICHAEL ANGELO

These two nobly conceived reclining figures compare favourably with the grandest creations of the Greeks, though they have not the value of the subtleties of the earlier masterpieces, and are more dramatic in pose and sentiment. These works, wrought with consummate skill, should inspire every student of modelling to noble ideals.

PLATE XXXIV

ONE OF THE FIGURES FROM THE TOMB OF LORENZO DE MEDICI

MICHAEL ANGELO

Florence

The composition and grand modelling of this figure are unsurpassed by any work of its kind. Note the construction, the splendidly varied planes of the shoulders to the plane of the pelvis, then across the knees. Then observe the plane of the face and the centre line up the torso over the chest and up the mastoid (neck) muscle into the skull. See how valuable, too, is the vertical arrangement of the right arm supporting the upper portion of the body, and the parallel line of the draperies up to the head.

From a photograph by Anderson

Plate XXXIV

TOMB OF LORENZO DE' MEDICI. DETAIL. BY MICHAEL ANGELO

From a photograph by Neurdein

Plate XXXV

LA RÉPUBLIQUE. BY DALOU

A modern work especially French in conception and modelling. It is excellent in its vigorous treatment and in its silhouette, and would, I am disposed to think, have proved its value to a still greater extent had it been placed a little higher—so that the whole of the outline could have been seen against the sky. Note how rich throughout is the modelling, though perhaps somewhat too equal in the shapes and quantities of the darks and lights. This, perhaps, may account for the work looking a little "noisy" and confused from this view.

PLATE XXXVI

WELLINGTON MEMORIAL

ALFRED STEVENS

St. Paul's Cathedral

One of the finest monuments ever erected. This work "builds up" so magnificently. There is a grandness in the tout-ensemble, *and the detail is beautifully rich, yet never noisy or overdone. It is a splendid example of the value of plain parts as contrasted with those enriched. The proportion of one part to another could not be better. The silhouettes of the sculptured groups are most interesting, and the lines of these in relation with the splendid architecture admirably considered. They are a portion of a grand conception, noble and big in the fullest sense. The effect of the details is as remarkable as that of the whole. On the top is shown Stevens's unfinished model for the equestrian group—an adaptation of which, by a modern artist, is about to be erected in its place.*

London Stereoscopic Co.

Plate XXXVI

WELLINGTON MEMORIAL. BY ALFRED STEVENS

Of relief work from the French school, I know of nothing so fine as the reliefs of Jean Goujon—exquisite in design, beautiful in their varying sense of colour (light and shade) in the outlines, and charming in style and relief, as well as their purposeful departure from true human proportions. At times they are almost Greek in feeling, except for the playfulness in movement. Much can be learnt from these beautiful works of the French Renaissance, plaster casts of some of which can be seen in the Victoria and Albert Museum, South Kensington.

I select for illustration "La République" by Dalou, not alone because I regard it so highly from an artistic point of view, but also because I consider it so distinctly Gallic in its entirety; in design and treatment, more so than almost any other modern work in France. Though perhaps at first it might be thought somewhat rococo in style, it is absolutely free from any extravagance. It is a work wrought by a master-hand, bold and free in treatment, full of life and movement, rich in decorative quality and modelling, playful in silhouette, yet as a whole restful.

Dalou returned to Paris to carry out this important work after spending some years in England, where he instilled much enthusiasm into the younger generation of sculptors of his time who were privileged to come under his care, and inspired them with the highest aims. He did everything in his power to establish a school in England, and his influence helped greatly towards forming the high standard of the present British school of sculpture

Of the moderns, Alfred Stevens must surely be placed first amongst sculptors, and his Wellington Memorial, of which we here show an illustration,

will bear favourable comparison with almost anything of bygone ages in Italy or Greece. Michael Angelo never got nearer to complete harmony in a conception of architecture and sculpture combined. Look with care at this great work, which stands in St. Paul's Cathedral. It came from the hand and mind of one who, at one time, was a modeller of stoves and fire-grates. Recognise how perfectly beautiful is the architectural proportion; the details are original and rich in design, never noisy, and always subservient to the more important parts, the decorative rendering of the attributes of war which enrich the sarcophagus, upon which rests the peaceful figure of the Hero of Waterloo, and the symbolical groups at either side and above nobly conceived. See how grandly these masterpieces jut out, making variety with the columns below which support them and the superstructure, and what strength of line prevails in the whole silhouette. And yet this giant is relatively unknown to the outside world, and his grave at Highgate is much neglected, for most people are not aware that his body was there laid to rest, and many do not even know that one Alfred Stevens lived.

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